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SUCCESS *with* HENS

ROBERT JOOS

GIFT OF
W. G. Hummel

SUCCESS WITH HENS

SUCCESS WITH HENS

By

ROBERT JOOS

UNIV. OF CALIFORNIA

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1914

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GIFT

PREFACE

EVERYBODY should be interested in a proposition which offers to the man or woman with limited means a chance to produce an article of food at a cost far below the market price, and, as a rule, of superior quality. The greater number of people are progressive enough not to let such opportunities pass by unheeded, and they are bound to take advantage of the opportunities possible in poultry raising. What other article of food which can be produced in a limited space offers as many varied forms of use as eggs? Eggs can take the place of meat, in fact, they are more healthful, and just as nourishing. It is a food that is recommended for the weak and the strong, for the workers and the invalids, for the old and the young, and for every one at all times and in every clime.

When one takes into consideration the limited space and capital necessary to equip a plant sufficiently large to supply the largest family with fresh eggs the year around, one cannot help but feel that the keeping of poultry should appeal forcibly to every one who has the opportunity. True, some are so situated that the keeping of poultry is impossible, but these are much in the minority. Even people living in flats, in large cities, very often have some

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little yard space which could be utilized for the poultry pens. I know of cases where poultry has been kept successfully upon flat roofs. I have every reason to believe the vast majority of families are so situated that they can keep hens, or, better still, to make the hens help keep them, and I am also of the firm opinion that it offers to them the opportunity to materially reduce the cost of living. This opinion is also shared by the many thousands who are now doing this very thing, and who are in a position to speak from practical experience.

Most any one can keep a small flock of hens in the back yard and make it profitable, but when it comes to embarking in the poultry business on a large scale it requires some knowledge, some experience, and some business judgment on the part of the operator or manager. A person without these qualifications or who is not in a position to employ some one with such qualifications should not attempt too much, but should start in a small way and let the business grow with the experience.

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SUCCESS WITH HENS

CHAPTER I

PROFIT AND PLEASURE WITH POULTRY

POULTRY raising offers pleasure, fascination, and profits to everybody. Any one having any kind of a lot should keep poultry.

If the figures were at hand to show the number of families that keep a few hens to furnish eggs and poultry for the family table it would be something astounding.

Getting away from the more congested districts and going out where the dwellers have yard space at their disposal, one will find back yard flocks almost everywhere. In such districts poultry is about as common as cats and dogs, and, of course, considered much more useful by the owners.

Why do all these people keep poultry? A few may keep them as pets, something to look at and admire, but the vast majority keep poultry because it pays. It means strictly fresh laid eggs at times when such are scarce and expensive, and with the absolute assurance that they are fresh.

Aside from this there is a fascination and pleasure in keeping good poultry. I say good poultry, because I doubt whether any one can take as much

real interest in a flock of scrubs. There is nothing to admire or breed for in a mixed flock, nor can anyone get as good results from such a collection.

The average town folks long for something alive, something that has a touch of nature in it, something to feed and care for and, last but not least, something that will furnish them good things to eat. What is more beautiful than a pen of fowls of one breed, of one color, of uniform size, and of one shape, basking in the sun on a bright spring day? It adds life to the home of the humble cottager as well as to the more pretentious home of the suburbanite.

One who keeps poultry as it should be kept will derive much enjoyment out of the work and time put into it. He becomes a poultry fancier; he studies their habits and endeavors in every way possible to develop their points of beauty and their capacity for productiveness; thus doing his share to improve the domestic fowls.

He takes a lively interest in everything his flock does, and he soon becomes accustomed to easily detect when anything is wrong with any of them. He knows the individuality of each specimen, he learns the habits of every one, and discovers the shortcomings which must be overcome, if possible, in the future generation.

The interest in his little backyard flock grows on him, and he can hardly wait until his daily work is

over to be home with his hens. He becomes a poultry enthusiast and the work he does in caring for the flock seems easy; in fact, he no longer regards it as work, but as a pastime and recreation. The poultry keeps him at home and he no longer goes out to look for other enjoyment which may cost money and do him no good.

The expense of keeping a small flock is little. The table scraps from any ordinary family will go far towards keeping a dozen or more hens. To this, of course, must be added a little grain fed in the litter each day, and a hopper placed before them at all times, containing oyster shells, grit, and charcoal.

People keep pets around the house which never bring in a penny, but a hen will always pay her way. There is lots of pleasure in going out into the henhouse in the evening and gathering enough real fresh eggs for breakfast the next morning. Just think of having eggs for soft boiling which can be depended upon and which have been laid by healthy hens in a clean, sanitary henhouse! With the proper care and feeding you can have such eggs in the dead of winter, when strictly fresh eggs are at a high price.

It does not require much room to properly house and keep a small flock. A space in the back yard eight by fifteen feet will be plenty of room to house and yard a flock of twelve or fifteen hens. Even if confined more closely than that they will do well,

providing everything about the place is kept fresh and clean and the hens are given lots of straw to exercise in. Nearly everybody handy with tools can build a neat little henhouse 6x8 or purchase the portable kind sold by poultry supply houses.

If you should live in a district where the neighbors do not appreciate the musical notes of the crowing cock at morn it would be well not to keep any male birds at all. The hens will lay just as well without a lord and master to call them to their meals, and sterile eggs will keep better than those containing a fertile germ. Those who keep hens in this manner can purchase baby chicks each spring to keep up their flocks and kill or dispose of all the crowers as soon as they show signs of getting boisterous.

Hens closely confined must be given sufficient exercise in an artificial way, and must have lots of fresh air. Deep litter feeding and open front houses will supply both of these necessities. Keep the hens scratching and keep the henhouse well ventilated. Fowls in close confinement also must receive a greater variety of feed, and more care than fowls which have unlimited range.

Fowls running on range find many things beneficial to them, which must be supplied in some other form when kept in small inclosures. One of these things are insects, which find a substitute in beef scraps, green cut bone, or blood meal. Another item is grit—poultry on farms find sharp gravel and

other substances which grind up the grains in the crops, but those in yards must be constantly supplied with some good manufactured grit. Then again hens running in the woods can find sufficient charcoal, while those penned must be supplied with the prepared product.

The drinking water is one of the most important things in connection with intensive poultry raising. Birds, at large, as a rule, have an opportunity to obtain clean, fresh water at all times, but those in confinement are ofttimes neglected in this respect. It is not only necessary to have water before the fowls at all times, but such water should be as pure, clean, and fresh as possible. Stale, impure, dirty water will breed disease. Not only should water be drawn fresh at least once a day in winter, and two or three times every day during the summertime, but the vessels into which this water is supplied to the flock should be scoured and well cleaned. Vessels which are not constructed in such a manner that they cannot be thoroughly cleaned, or which have any recesses which cannot be reached with ordinary effort on the part of the operator, should not be installed in the poultry plant.

Small runways must be well looked after. They must be kept clean, spaded or raked often, and, if very small, refilled with fresh loam or ashes. The latter are not recommended for yellow legged fowls, as they have a tendency to affect the color of the

legs and feet. Many back yard poultry keepers have two small runways to each laying house, thus making it possible to plant each yard alternately with oats, rye, or other quick growing grasses. Where space permits this method is preferable. On the other hand, there are those who pay little attention to the runways, thinking it only necessary to clean the henhouse and let the yard take care of itself. Such neglect is liable to result in disease.

In building runways it is well to have the location high and dry and running toward the south if possible. By building the yards on the south side of the house they are protected to a certain extent from the cold winds, which means much to the flock during the colder months. Soil should also receive attention. Clay, which bakes dry and hard during dry weather and gets soft and muddy during rains, is anything but satisfactory for a modern poultry yard. Such ground should be covered with a good layer of black, sandy, or gravelly soil or may be topped off with clean cinders well rammed and rolled.

Poultry wants plenty of shade in summer, and in constructing runs this must have consideration. Trees in or adjacent to the pens or sunflower or other plants are commonly and successfully used for this purpose. Small, low runs may be partly covered with canvas or roofing paper or vines may be planted so as to give the hens a shady retreat. Com-

fort is an important factor in keeping the flock in the best laying condition, and this is just as necessary in the run as it is in the laying house.

Confined hens require more exercise than pullets of the same breed, as they are inclined to fatten more rapidly. By giving the hens a deeper litter to scratch in they are compelled to work harder for their food and the feeds, both grains and mashes, should contain less fattening matter.

Strange as it may seem, it is a well known fact among authorities on poultry raising that confined poultry when properly housed, fed, and cared for will average a larger percentage of eggs than those on large range. The vitality of the offspring may in time be diminished, but the confined flock will lay eggs and plenty of them.

CHAPTER II

COMMON SENSE NECESSARY

POULTRY RAISING, like any other business, requires work and good judgment. The poultry business is not hard labor, but it does require a certain amount of exertion on the part of the operator. It is not a lazy man's occupation, and a person with no ambition will not be much of a winner in the poultry line.

To be a successful poultryman one must have ambition and patience. Without either poultry work should not be attempted, unless perhaps profits are not to be considered. A drone in the poultry business will not last long, and one without patience may become discouraged before he fairly gets started on the road to success. One with good judgment generally has patience. He knows that every business has its drawbacks and some discouraging features; he knows that everything cannot be accomplished in one day, and that a loss is a good lesson, although it may be costly. If his hopes are not realized he does not give up in disgust, but tries and tries again until he meets success face to face.

A man without ambition is careless; he puts off until tomorrow what should have been done today.

This will never do in the poultry business. There are things that must be done today. Carelessness spells ruin to a poultry plant. It has put more than one poultry raiser on the list of the "has beens," and diminished many a good sized bank roll.

There have been failures in the poultry business, but not any more in proportion than in any other business. When a man fails in the poultry business he immediately tells all his friends about his misfortunes and condemns this vocation in the loudest terms, and although he realizes his shortcomings he becomes a full fledged member of the "Knockers' Club." He tells of so and so also making a failure of the business, but never mentions the countless numbers who are making good in the same line.

But the American hen goes on supplying the breakfast table with its most popular victuals and the dinner table with healthful and delicious meats not tainted with lumpy jaw and tuberculosis. And what is more, thousands upon thousands of farmers' wives are clothing the entire family from the profits of the hennery; thousands of large poultry plants are making good dividends upon their investments, and countless numbers of backyard poultry raisers are supplying their tables with eggs and fowls besides deriving therefrom some extra money in addition to the salary earned from their regular vocation. An industry which ranks next to corn in dollars and cents, and then only partly figured, in

the United States census reports. Does that look like an unprofitable business? Could an unprofitable business grow to such an enormous industry?

The man who works and uses good common sense in the poultry business is going to make a success of it. Remember, success in this business is not always measured by the dollar you put into it. It is the management of the plant which brings about the profits. If perhaps you are going into the poultry business as an investment and do not intend conducting it yourself great care should be exercised to select the proper man to manage such an institution. Good managers are not picked up every day. There are many who pose as being capable of handling anything in that line, but when placed in charge prove themselves incompetent. On a large plant where more help is needed it is much better to have an expert poultryman surrounded with ordinary laborers than to have all half way poultrymen, and no one who is fully qualified to handle all the details of such an undertaking. One good man who knows his business can get along with inexperienced help and win out.

There are people who go into the poultry business with the idea that all they need do is to buy an incubator, say, for instance of 250 egg capacity, fill it up, hatch 250 chicks, and then sit idly by and in the fall take these 250 chicks to the market and carry home $150, the proceeds of the

sale. They do not consider that the chicks require attention, and the result is the chicks never live until market time, having become the prey of rats, disease, vermin, or something else—another case of lack of judgment. Live stock, no matter what it may be, must have attention. It must have good care, proper feed, fresh water, sunshine and shelter, and without these it cannot live. Even with all these things there will be some losses; a few deaths in the best cared for flocks cannot be avoided.

The poultry business offers big opportunities for the poor man, as it can be started on a small scale with very little capital, from which it can be increased gradually to an independent livelihood, but it means some work and a whole lot of good common sense.

CHAPTER III

METHOD TO BE USED

THE question of method confronts every beginner in poultry raising, and such beginner must decide whether to follow the old way, hatching by hen, or using the modern method, the incubator.

Before making any definite decision along this line several things must be taken into consideration, and no one should decide such an important question without giving it lots of thought. Facilities at hand must come in for a big share of consideration; location and breed must not be overlooked.

There is no question but what incubators, the right kind of incubators, are preferable to hens, and it is also a fact that a large poultry plant could not be operated nearly as successfully with hens as with machines; but there are on the other hand many individual cases where incubators are unprofitable to operate. For instance, the poultry raiser who only wishes to raise a couple of dozen chicks would be exercising extravagance by using an incubator.

People who can find room only in the kitchen for setting a machine, where the temperature goes from one extreme to the other, had better not attempt to use an incubator. The best machine

on the market could not turn out satisfactory hatches where there is such a difference in the temperature. A good regulator will take care of the small changes satisfactorily, but where the variation is so marked as it would be in most kitchens it is impossible to keep the incubator egg chamber at a uniform temperature.

I have had people complain to me about the poor hatches from their incubators, and upon investigation I found many of these complainants' machines being operated within a few feet of the kitchen stove. One of these same people had one of the best basements I ever saw for hatching purposes, and when I asked him why he did not set his machine down there he replied: "I want it handy so that I need not go down into the basement at night to look after the machine and see that it is running right." I told this party that if he moved his machine into the basement, regulated it correctly to start with, and looked after it each morning and evening he would not need to get up at night; in fact, he need not worry about it during the night. No wonder this party had to get up during the night and look after his regulator and lamp flame; the temperature of his kitchen dropped considerably during the night, hence it was absolutely necessary for him to look after it.

Should the decision have been made in favor of the incubator the question then arises what kind

and size to buy. The answer to this question is: Buy a good one, and let the size be governed by the facilities at hand to obtain the hatching eggs and the raising of the chicks.

It would be folly for a small back yard poultryman with only a small flock of, say, a dozen hens to buy a 300 or 400 capacity machine, and it would be equally imprudent for a man with 100 or 200 hens to purchase an incubator with a capacity of only fifty or sixty eggs. A small poultry raiser with a small flock would be compelled to save his eggs too long to fill one of the larger machines. Eggs may be safely kept for hatching for a period of two weeks, providing they are turned each day; but to obtain the best result from the hatches I would not advise setting eggs older than this.

Where hens are to be used for this work care must also be exercised in the selection of such hens. The disposition of some hens is such that they oftentimes are poorer hatchers than the worst incubator made. Some hens are unreliable, sit on the nest for a few days, only to forsake it again; and some hens are so clumsy and awkward they break the eggs.

Never select a wild hen; the tame ones make better setters and mothers. It is not advisable to select the large, feathered leg varieties for setters, nor birds crossed with the nonsetting varieties. Plymouth Rocks, Rhode Island Reds, Wyandottes,

and other medium sized varieties make the best setters, but even in these varieties unreliable hens will be found.

It is a good idea to set either three or six hens at one time if such a thing is possible. This will give you a chance to give the results from three or four hatches to two hens to brood, make it possible to reset some of the good setters, and at the same time have more chicks of a uniform size and age.

Do not attempt to place any eggs under a hen until after such hen has been thoroughly treated with a reliable lice killer. Tobacco stems placed in the bottom of the nests will also assist in keeping the hen free from vermin. Many hens leave the nest on account of being pestered by lice, and even if they do stick it out the lice will be transferred to the chicks. A dust bath should also be provided for the setting hen, and the nest and all surroundings must be kept perfectly clean at all times during the incubation. Filth breeds vermin and disease.

Keep the setters away from the rest of the flock; feed them grain food, charcoal, grit, and clean, fresh water. A little rusty iron dropped in the drinking water during this period will act as a tonic and keep the hens in good condition.

CHAPTER IV

STARTING IN SPRING

SPRINGTIME is without a doubt the best time to start in the poultry business. Matured stock cannot as a matter of fact be purchased as cheaply then as during the fall and early winter months, but those contemplating embarking in this vocation at this season of the year should obtain either eggs for hatching or baby chicks. In either case these should be purchased from a reliable breeder, one who has pure bred stock of the variety to be selected.

Whatever you do get thoroughbred stock, and do not be misled into buying scrub chicks or eggs because they are cheaper. There are many reasons why good stock should be selected. For market purposes the larger breeds will dress to a more uniform size and shape. Their plumpness and even color of skin will attract special attention and will commend them to the buyers. The storekeeper who buys poultry will appreciate this uniformity of color, size, and shape, and as a rule will pay more for such dressed fowl.

A mixed flock cannot be fed with as much success for best results as a flock of one breed of uniform size and similar habits. Take, for

instance, a small variety such as the Leghorn, which requires far different feeding and care than the larger varieties, such as the Orpington or light Brahma.

In other words, they don't hitch well together and you cannot possibly get the best there is in either by permitting them to run together. One is more nervous and active, while the other is more quiet and less busy.

What is true of a mixed lot of thoroughbreds is equally true of a lot of scrubs, cross bred mongrels, which is bound to result in having many different shapes, sizes, and colors in the flock. A flock of thoroughbred hens of one variety will lay eggs of a more uniform color, size, and shape, thus increasing their market value as a fancy trade product.

The public, especially that part of the public which is willing to pay a fancy price for good things to eat, demand eggs of a uniform shape and color. Such eggs cannot possibly be obtained from a mixed flock of fowls.

Thoroughbred poultry, in keeping with all other kinds of live stock, has been bred for years and years with certain definite objects in view. We have breeds which are especially adapted for table use, while others have been bred along the line of egg production only.

Take the Leghorns, Campines, and Minorcas—where can we find their equal among the scrub

fowls, not alone as perfect egg machines, but non-setters as well? It has taken time and skillful breeding to bring them up to their present standard of productiveness, and the breeders are still improving them in this particular line.

When you buy common eggs of unknown breed and hatch chicks from such eggs, you do not know what they will mature into, whereas, if you buy eggs laid by hens from some known breed you know, to a certain extent, whether you will have egg producers or market fowls.

Another point which should not be overlooked by the novice—when you raise good poultry, bred from good stock, you can always sell a few cockerels and surplus pullets at a price considerably better than that to be obtained from the butcher or grocer. If you are only a small back-yarder you stand a show of selling good birds to your neighbors at fancy poultry prices.

The appearance of your uniform flock will bring about these sales. Such flocks are noticed and commented upon by almost everybody, whereas, on the other hand, a flock of scrubs or mixed breeds never receives as much as a passing notice. On a green, well kept place in the suburbs what is more attractive and is more noticed by the passer-by than a flock of hens all of uniform color and general makeup? It adds an air of prosperity to the surroundings.

Should you decide to purchase eggs, and these eggs are to be intrusted to setting hens, care must be exercised in the selection of such hens. A wild, scary hen may result in broken eggs or a forsaken nest. A good plan is to try the hen out for four or five days on glass eggs, and then study her habits as closely as possible.

The purchasing of baby chicks has become popular in the last few years, and many prefer to buy these instead of the eggs for hatching. A common mistake made by the amateur poultry keeper is to buy those quoted at the lowest prices. Hatcheries which quote baby chicks at ridiculously low prices either hatch these from eggs laid by inferior stock, or the chicks lack vitality. A reliable poultry raiser can always find a ready market for baby chicks at a fair price.

My advice is, if you cannot afford to buy good chicks better buy eggs for hatching. It is a waste of time and money to buy the inferior grades.

CHAPTER V

STARTING IN FALL

THE fall months offer some advantages to start a poultry plant. At that season of the year good breeding stock can be purchased at a reasonable price, owing to the fact that poultry raisers are in most cases compelled to sell some of the same year's breeders to make room for the growing stock,—the pullets and cockerels that were hatched in spring.

To start in the pursuit of poultry raising in the fall of the year, it is necessary to purchase matured stock. Before this is done it is absolutely important that some thought be given to the subject. The right start means much to the future success of the undertaking.

First of all you must decide wisely on the breed you wish to keep. There are many good breeds of poultry, and most every standard variety has its many friends, who are always ready to tell of the superior merits of their respective favorites. The beginner, if he has spent any time at all reading up on the subject, has no doubt had his thoughts filled with many convincing arguments as to the best breeds, etc. In fact, the opinions

expressed are so varied and cover so many breeds that he is bound to be puzzled in choosing a variety.

There is only one to decide this most important question, and that one is the beginner himself. Select the variety which you most admire, providing, of course, such variety meets the requirements necessary for the particular branch of the business you wish to follow. For instance, if you only want eggs and many of them, select one of the lighter breeds, such as Leghorns, Minorcas, Spanish, Campines, Hamburgs, Anconas, Polish, etc.; if only meat, select the heavy breeds, such as Brahmas, Cochins, Langshans, etc.; if both eggs and meat your choice should fall on the medium breeds, which include the American varieties, such as Plymouth Rocks, Wyandottes, Rhode Island Reds, etc., or some of the foreign breeds, such as the Orpingtons, Dorkings, Faverolles, Houdans, etc. By making your selections according to the foregoing classifications, and choosing therefrom the breed which strikes your fancy the most, you cannot go far wrong.

Do not attempt to start with several varieties, one is quite sufficient and two should be the limit of your ambitions. Beginners who start with a half dozen varieties very seldom make a success of any one. Different breeds require different care, housing, and feeding, and it will be to your interest to put all your thoughts on one breed to start with

and master the handling of this one breed before tackling more.

Another common mistake made by beginners is in exercising little judgment in selecting stock—buying promiscuously without any regard to the strain or future ancestors. Some even go so far as to purchase their foundation stock from the crates at their grocers and butchers, selecting therefrom birds having the appearance of the variety which they intend to keep. In selecting your breeders in such a haphazard manner, a hundred chances to one you will never make such a flock profitable. You may possibly in this way get pure bred stock of the variety you want, but only get the worst culls, stunted, barren, or disqualified specimens of that breed. You cannot expect anything else as those shipped to the merchant are as a rule discarded birds, fit for only one purpose—to eat.

By all means buy from a breeder, one who has a good vigorous strain and one who has given his breeding stock the proper care and attention. You cannot expect healthy matured fowls from chicks which had much hardship to endure, possibly overrun with lice, or improperly fed and watered, or not supplied with the necessary heat during their first few weeks. Buy from a responsible breeder so that you will get just what you pay for and ofttimes a little more. When writing such a breeder

tell him that you are a beginner and give him an idea, if possible, just about how much you wish to invest in breeding stock. If the breeder is honest he will take an interest in you because you are a beginner and nine chances out of every ten he will give you a fair quotation and give you full value for every dollar invested with him. Of course, there are some who will, if they get a chance, fleece a beginner, but such unfair breeders are few and far between. Poultry raisers who treat their customers dishonestly are soon found out, with the result that their advertisements will not be accepted by the better class of papers.

To start in the poultry business in a small way it is advisable to purchase from some reliable breeder a pen of good stock birds. It will give the beginner an opportunity to study the habits of poultry, the care and attention necessary for their welfare, and give him an idea as to approximate cost of their keep. Too often amateurs start raising poultry with the idea that every dollar derived from the poultry plant is clear profit, not giving the feed bills and other necessary expenses the least thought. Such beginners are very apt to become discouraged with the business before they have fairly started, and as a result they lose interest and quit with a loss. To feed poultry economically and yet properly is not child's play, it means study and careful management. Poultry writers may tell

you to feed so and so much to a flock of so many hens, but if you follow such advice to the letter you will in time find that advice is in most cases not practical. There is only one sure way to feed poultry properly and that is gained only by practical experience with the flock. That is why I say buy a pen of birds to start with and thus gain knowledge in a practical way.

By buying a pen of fowls in the fall you have an opportunity to get some strictly fresh eggs from your own hens during the winter months, when such eggs are difficult to purchase. To be rewarded with some nice eggs within a short time of starting to keep poultry is encouragement enough to the average beginner to spur him on in the work he has undertaken, not to mention the possibilities of immediate profits from the little flock. Encouragement is what a beginner needs, something to show for the work and time put into the enterprise.

In buying the nucleus for your poultry yard care must be exercised in what you buy. Remember you are laying the foundation for your future flock, and a blunder now may mean future trouble and ultimate failure. Study well what breed you want to keep, hasty action may result in selecting a variety which would not meet your fancy later on, and possibly a breed which is not adapted to the conditions and surroundings of your particular plant.

After the breed has been finally decided upon efforts should be put forward to obtain the best possible at the price you can afford to pay, and care taken to get birds free from disease and of vigorous stock. By buying from a responsible breeder much of the difficulties in these particulars can be avoided, and in most cases the beginner will get full value for the money invested.

Never buy a bird which has any deformity, such as a crooked breast bone, a crippled foot, a turned under toe, a wry tail, or any other bodily defect. Fowls which have been stunted in their growth, whether from disease or neglect, are a bad purchase and are expensive at almost any price.

The early fall also is an excellent time to put up poultry houses, fencing and other necessary things required for the proper housing and caretaking. The weather is ideal for such work, in fact more so than the early spring when the heavy rains are liable to retard operations along this line.

Even if you are only keeping poultry for the eggs and meat it is advisable to pay some attention to the fancy side of the business. It creates more interest in the work, and at the same time makes it possible for you to get a much better price for the surplus cockerels, the eggs, and the baby chicks, which are sold to others interested. If you only keep a small flock with the sole object in view of supplying the poultry products for the home table,

by paying some attention to the fancy end of it you can, without doubt, sell enough surplus fowls and eggs for hatching to pay all the running expenses of the small plant, and still have a surplus besides. Many backyarders are following this plan and doing nicely.

If the fancy side is to have any attention at all you should pay a little better price for your foundation stock, study the standard requirements of that particular breed, and make your yearly selections from the young stock according to points of the American standard of perfection, and not use your personal hobby on a certain point as "just the thing." Good thoroughbred poultry is attractive, be the breed what it may, and at the same time it is more productive. Utility and fancy go hand in hand, providing neither is overdone. If it were not for our carefully selected standard varieties we would not have attained the wonderful egg records attained by the American hen today.

If possible beginners should attend some good poultry show, where the many different varieties are on exhibition. There is nothing so educational to the poultry raiser as these shows, and more knowledge can be obtained on the various breeds in this manner than by any other.

CHAPTER VI

EARLY HATCHING

MARCH should be the busy month in the poultry plant. It is virtually the opening of the breeding season. There is much to do for those who realize the importance of having as many early hatched pullets as possible. The old saying is "the March pullet the big money maker," and this is especially true in the larger breeds, the kind that do not develop so rapidly. March pullets will lay, or rather should lay, early in the fall, just about the time the old hens are beginning to molt, and naturally stop laying. The cockerels hatched during this month will make early summer broilers, or early fall roasters, hence commanding a better price than those hatched later.

Those catering to the fancy side of the business will find the March hatched birds more valuable both as breeders and as a salable proposition. Early hatched fancy fowls are much in demand for the fall fairs and early shows, and also have a decided advantage in competition at the winter poultry exhibitions. They are more developed in the various points which go to make up the particular breed to which they belong.

It is not so difficult to hatch the early chicks, but

to raise them requires special attention and care. Winter is only in hiding, even though the days be moderate, and sudden drops in temperature should be looked for during the entire months of March and April. Take no chances, prepare for these conditions, have your baby chicks protected from such changes in climatic conditions. A little precaution in this direction may save you many dollars; exposure on one night may kill more chicks than you could hatch in a three weeks' run of the incubator. Watchfulness and forethought are a necessity in successful poultry raising.

This is the time of the year when hatching eggs are in big demand and herein lies the temptation offered to poultry breeders to sell their eggs at good prices. The cash looks attractive and ofttimes influences their business judgment, resulting in an oversale of the early hatching eggs, leaving them no eggs for their own incubators. Such poultry breeders fail to realize that these early eggs are worth just as much to them for hatching purposes as they are to others.

A good idea is to figure out approximately how many eggs you intend to set this season and then apportion so many for each of the following months —March, April, and May. By following this plan there is not much danger of overselling and the breeder will not disappoint himself in his own hatches. To sell all the early eggs and depend on

the late ones for your own hatches is poor policy, and is bound to result in a loss to the plant.

A word of advice to those who hatch with hens. Avoid having too many small flocks of chicks, of various ages and sizes. It is unwise for any one to so plan his hatching and brooding as to be compelled to look after a dozen or more flocks consisting of six to twelve chicks each. It is evidence of lack of system and results in saddling upon oneself a greater amount of work to properly look after such flocks.

The fact of the matter is a person can take care of a flock of twenty-five as easily and as quickly as a flock of ten. Wherever possible combine small flocks of the same sizes and ages.

It takes planning ahead to bring about this result, but such things can be easily accomplished by setting a number of hens at the same time. Do not attempt to combine flocks with decided differences in sizes, for the smaller ones are bound to be at a great disadvantage, which will result undoubtedly in stunting them for the balance of their lives.

Do not overcrowd your breeding stock at this season of the year; give them plenty of room, exercise, and sunshine. Do not force their laying capacity. What you want now is fertile eggs. It is not now a question of how many eggs your hens lay, but are those eggs fertile and hatchable? Will they bring forth good strong chicks with lots of

vitality? Give them plenty of green food. They must have that in order to bring the right results.

See to it that your hens are not too fat. Fat hens will not as a rule lay many fertile eggs. Do not let them get lousy. Examine closely for these pests, and if any are found use the louse powder freely. Just because the fowls are running out do not neglect to provide a dusting bath in a dry place protected from the rains.

Gather the eggs often so that they will not be chilled, and do not keep them either in a too hot or a too cold room. Much of the success in the hatches depends upon the keeping and handling of the eggs beforehand.

Clean quarters, lots of fresh air, and good protection from the cold spring rains are what the breeding pens must have. The special care and attention bestowed upon them now bring reward in full measure.

Always keep in mind the fact that to make poultry raising profitable it is absolutely necessary to build for the future. In other words, we work today for results tomorrow.

CHAPTER VII

EARLY FERTILITY

DURING the month of March there are always many complaints about eggs not hatching. The reasons for them are many, some of which could be avoided if the amateur poultry breeder would pay more attention to the laws of nature.

April, May, and June are the natural months for domesticated hens to lay and brood. During those months the hens get the proper amount of sunshine, vegetation, and other necessities which promote conditions ideal for productiveness. If we want earlier hatches, and most of us do, it is then only natural that we must supply these seasonable conditions in an artificial way. Those who neglect to do this will not get a large percentage of hatchable eggs, and those that do hatch are liable to produce a chick lacking in vitality.

To produce the right kind of early hatching eggs it is necessary to have a properly constructed henhouse, one which is well protected from the fierce north and west winds, windows facing the south affording lots of sunshine, and also fresh air both during the day and night. A well protected scratching shed is also advisable, but this can be dispensed with, providing, of course, the henhouse proper is

of sufficient size to afford comfortable exercise to the flock.

One of the common mistakes is to overestimate the capacity of a henhouse. Amateurs in their desire to get as many eggs as possible from a flock confined in a limited space are apt to keep more hens than they should, with the result of less eggs, infertile eggs, sickly chicks, lice, and disease in the flock. My advice is to keep less and keep them comfortable.

The next point to consider in the production of early fertile eggs is the supplying of vegetable matter of such a quality and in such quantities as they would be able to find when running at large later in the season.

This in many cases is a difficult problem with the inexperienced poultry keeper, who is not versed in the modern methods used by breeders to supply such vegetation. One of the easiest green foods to produce is sprouted oats, and it makes an excellent feed for both laying hens and chicks. This can be produced in racks in any warm room or basement, and at a cost within the reach of every one. One strong recommendation for sprouted oats is that it can be grown rapidly and can be fed to the hens fresh every day. Aside from that, it is tender and juicy and much relished.

Next to sprouted oats I would recommend well

cured, short cut alfalfa, which has been scalded the night before and left to soak until morning, when the water should be squeezed out before it is fed to the hens. Mangel roots, turnips, raw potatoes, cabbage, etc., are also used quite extensively for the same purpose, with good results.

Hens which have been forced to the limit for egg production during the winter months are not in condition to lay eggs that are strong in fertility. Many condiments and so-called "laying foods" have made many flocks worthless as breeders. It is only natural that fowls which have been overworked by artificial methods for three or four months lose a large percentage of their vitality, and a loss of vitality will surely have its effect upon the spring crop of eggs which are to be used for hatching. Even if they should hatch, one cannot expect healthy, robust chicks from parents which are in a weakened condition.

Many an inexperienced poultry keeper will now pay the penalty for trying to force the eggs from the hens when the prices for such a commodity were high and the demand lively. My advice to such is buy eggs for hatching instead of using your own.

The fertility will run low if the hens are too fat. To get the best results from the hatches the hens must be in the pink of condition, which means

healthy, vigorous, active, and free from lice. A lousy hen cannot possibly be at her best; lice are bound to sap the vitality from any hen.

Most poultry breeders selling eggs guarantee about 75 per cent fertility after April 1, and some require that the eggs be tested before the sixteenth day, all infertile ones to be returned not later than that date. If such eggs are found to be infertile the number making the full 75 per cent will be sent to the purchaser.

Any responsible poultryman nowadays wants the eggs sent out to hatch as many chicks as possible, and is always well pleased when customers report big hatches. The best reputation and advertisement a breeder can get in an ordinary way is to have eggs from his pens show strong fertility. It is therefore of vital importance to the poultry raiser to do everything in his power to bring this about. Experiments along the poultry line have demonstrated that nature can be assisted in many ways, and the production of fertile eggs is no exception.

CHAPTER VIII

LATE HATCHING

MAY is one of the best months to start the rearing of chicks in an artificial way. The reason for this is that weather conditions are very unsettled during the early part of the season, and unless the poultry raiser is fully equipped to meet such conditions the losses from the early hatches are apt to be many. During May the chicks can be put into an outdoor brooder and given a chance to run on the ground or grass, which is most beneficial to them. Chicks reared in the open air from the beginning are, as a rule, more hardy than those brought up like hothouse plants in warm rooms and on board floors. They develop quicker and are less liable to disease, two very essential items in profitable poultry raising.

Pullets hatched in May will, if given the proper care, feed, and attention, lay the following November, when eggs are demanding good prices, and when the old hens have not as yet fully recovered from the molt. The experienced breeders of Leghorns or other Mediterranean varieties as a rule select the May hatched chicks for their own breeding and laying pens. Experience has taught them that pullets hatched during this month develop into "payers."

When it comes to the heavy varieties, such as the various breeds of Asiatics, Cochins, Brahmas, etc., the preference is given to the earlier hatches, but not so with the smaller breeds. Even in the American varieties, among which are the Plymouth Rocks, Rhode Island Reds, and Wyandottes, the May hatched chicks are very popular. True, the American varieties do not develop as rapidly as the Leghorns and other smaller varieties, but nevertheless the May pullet, if given the right chance, will lay before the snow flies.

If the eggs from stock with the proper health and vigor are used for hatching, and if the chicks when hatched receive that attention necessary for their steady growth and development, there is no question that May hatched chicks from the American breeds are very desirable. They have many things in their favor, chief among which are enough natural advantages to make them grow more rapidly than those hatched during an earlier period of the season. Sunshine, air, fresh soil, green grass, and natural surroundings will do wonders for the newly hatched chicks, and one week under such conditions will bring about more development than two weeks of close confinement indoors, with less air, little sunshine, no tender grasses, and hard boards to run on.

Artificial rearing of chicks does not mean that the chicks can be successfully deprived of all things

nature intended they should have. Artificial methods are only successful when coupled with natural surroundings, conditions, and feeds. To carry artificial methods to any extreme is bound to result in poor results, followed by a condemnation of the artificial hatching and rearing of chicks. Most of those poultry raisers who have tried both methods of incubation, and have found the old hen preferable, have been extremists who have carried the artificial methods to such a point where reason ceases. The incubator and brooder can do wonderful things, but they cannot supply every condition nature intended, unless assisted. The sooner the novice comes to this conclusion the sooner he will find himself on the road to successful artificial incubation and brooding.

No matter if the eggs come from the most vigorous stock and are possessed of the strongest germ, if the chicks are not given the chance to get as close to nature as possible, confined perhaps in a broodhouse without an outdoor run, those chicks cannot develop into strong pullets and cockerels. It is surprising how many chicks are annually brought up under such unfavorable conditions, and some by poultry raisers who should know better. Is it any wonder some poultry breeders are always complaining of poor hatches, of weakly, sickly chicks? The wonder is that nature does not rebel altogether against such unreasonableness.

Another advantage in the later hatches is the fact that the fertility of the eggs runs higher on an average. Every well regulated, properly mated, and properly fed flock should during April and May average not less than 80 per cent fertility.

Beginners need not hesitate about buying day old chicks in May. They have nature with them, which is an item well worth considering.

Even fall hatching is profitable, as pullets hatched in the early fall will start laying the early part of the following spring, and will develop into heavy layers the next summer. Southern poultry raisers do considerable hatching during the fall months, and seem to have good success. The fall-hatched cockerels can be marketed as early broilers, and both sexes can be marketed as dressed squab broilers when weighing ten to sixteen ounces. These squab broilers are in big demand by the high-class restaurants and hotels, and as a rule bring the best prices during February and March. To carry on the successful hatching of fall chicks, it is absolutely necessary to use incubators and brooders, as broody hens are not obtainable during the fall months.

CHAPTER IX

UTILITY AND FANCY POULTRY

To make the most out of a back yard or small poultry plant it is advisable to cater both to the utility and fancy side of the business. On a small scale they work well together and make it possible to have a steady income the year around. The fancy trade is seasonable and if no attention is paid to the utility end there will be several months in the year when everything goes out and nothing comes in. For the beginner with little capital the expense item in the off season will present a hardship and ofttimes discourage him in his endeavors. He must find some way to overcome this drain upon the small treasury. The marketing of table eggs and poultry will solve this problem satisfactorily.

Beginners who are contemplating the breeding of a fancy strain should therefore not overlook the utility qualifications of the breed or breeds to be chosen. There are some varieties of poultry which are ornamental and nothing else. They are beautiful in appearance, exceptionally pleasing to the eye, but as layers or table fowls they are far from profitable.

Poultry fanciers, who raise poultry for pleasure only and who have the necessary money to spend

on such a hobby, can keep such ornaments of the poultry family, but those who must of necessity depend upon the flock to pay the feed bills, etc., will find it advantageous to combine both fancy and utility qualifications when making the selections.

A poultry raiser who depends upon both branches of the business will cull his flock more closely and thus help to improve the quality of standard varieties both for fancy and utility purposes. Upon him we must depend in a great measure to improve the laying qualities of our many breeds of pure bred poultry, and to combine both beauty and utility in the same hens.

All of this leads me back to the oft repeated advice, never start with scrubs or a mixed breed. If finances are limited buy less fowls, eggs, or baby chicks to start with, but whatever you buy let it be a good breed from a good strain and from a reliable breeder. To buy anything else will result unprofitably and disappoint in the end. The start means all and upon this depends your future success or failure as the case may be.

Fancy buildings are not necessary; better spend less for these and more for the occupants of such buildings. Remember it is the stock which brings in the dollars and not the houses and yards.

There is an old saying in poultry raising which always holds good, "Good stock for the best

results." Many overlook this oft repeated advice. They do not grasp its full meaning or its importance. Some beginners who are about to embark in the utility branch of the business think this advice is given by breeders of good stock as an incentive to the inexperienced to buy their fancy stock. This is far from the truth.

The breeding and improving of thoroughbred stock—cattle, hogs, horses, sheep, or other domesticated animals—has improved the marketable quality; it has also materially increased the value of the stock upon the farm. Pure bred cows produce more milk than the ordinary scrub cows, the best beef comes from the well bred cattle, and the highest grade pork comes from the so-called fancy hogs.

This is only natural when one takes into consideration the fact that well bred stock is carefully selected and mated. The finest and most vigorous are selected for breeding purposes and such stock is generally kept under better and more sanitary conditions.

What is true in this respect in other live stock is also true in poultry. The best individual and pen egg records made at experimental stations were made by thoroughbred poultry of some of the standard breeds. The most attractive, uniform eggs sold upon the market or supplied to private trade are laid by pure bred hens, and the plumpest

and juiciest fowls come as a rule from the farms and poultry yards keeping nothing but well bred poultry.

In breeding for the show room, as well as for the market, more attention must be given to the proper mating of the breeding pens, but this extra effort on the part of the poultry-keeper will be rewarded by bigger profits and a better flock of fowls in every way.

CHAPTER X

CONVENIENT EQUIPMENT

It is a natural trait of mankind to do things which are convenient. Convenience in our daily routine tends to make our work more enjoyable. Convenience saves time and tends towards efficiency. A carpenter without the proper tools could not build a house as quickly and as well as he could with the right tools. This holds good in the keeping of poultry.

There is a difference in just merely keeping poultry and keeping it properly, and it may be made a pleasure or a burden. Convenience tends towards making poultry keeping a pleasure. It saves time, labor, and often disappointments. It helps to do things well which otherwise might only be half done.

First of all the poultry keeper should have a convenient place to keep poultry—a house sufficiently large for the number of hens sheltered therein; not necessarily a fancy house, but one that is cozy, properly ventilated, well roofed, free from drafts, handy to get into, easily cleaned, and with good interior arrangements. Such a henhouse, be it ever so cheaply constructed, will make a convenient home for the flock.

Next is the run or yard, where the hens spend most of their time during favorable weather. This is the summer exercising place and playground, supplying the fowls with two important necessities for their health and productiveness—fresh air and mother earth to scratch in.

Personally I prefer a good sized runway, but it is not an absolute necessity to have this so large. Of course, if the run is small it must be more often cleaned and spaded so as to keep it fresh and sanitary. Whatever the size of the yard, it should be well drained, free from low places where water will stand, and free from soil which will bake hard during hot weather and get muddy after a rain.

The best soil for a run is one which absorbs the water, leaving the top soil quite dry shortly after a rain. I do not advise using cinders or ashes as a covering for the yards, although it is sometimes necessary to resort to them where the soil is unfavorable.

Where space permits, it is a good idea to have a double run for each pen, which permits the seeding down of the runs with oats or other quick growing grains, and then alternating the fowls from one run to the other. By this plan the hens can help themselves to their green food, and they certainly do enjoy such freshly grown tender grasses.

After the house and the runs are completed equipment necessary for the operation of the little poultry

plant must come in for a big share of consideration. The equipment is the "tools" with which the work is carried on, and upon the careful selection and installation of equipment depends the facilities for doing the work with the least burden and inconvenience.

There are many devices which can be done away with, not being absolutely necessary to keep poultry successfully, but on the other hand there are labor saving devices which save both time and work, and incidentally increase the pleasure of taking care of the flock. Among these are the various kinds of drinking fountains, automatic feed hoppers, nest boxes, feed troughs, grit and shell boxes, lice killing machines, automatic exercisers, lice proof roost supports, etc.

Every year there are new poultry appliances put upon the market. Some of them have real merit, while others are only a luxury, and absolutely unnecessary. Beginners should be careful what they buy along this line, for much money can be wasted on useless devices. It pays to buy equipment which saves time and labor, as it is just as important to be up to the times in the poultry business as any other line. The question of how much a beginner can afford to invest enters into the question of what equipment to buy, but I would advise stretching a point to buy something durable and reliable.

No other equipment about a poultry plant needs to be selected with as much care as an incubator and brooder. Thousands of eggs are wasted every year through the use of inferior incubators, and thousands of chicks die annually from being forced to dwell in a poorly constructed brooder.

It may cost a few dollars more to buy a good incubator to start with, but the saving in eggs which are apt to be spoiled in a poor machine will more than make up the difference in the cost during the first season's run, not to mention the time and work wasted.

A good machine is also more convenient to operate; it does not require constant care and watching. Such an incubator can be properly adjusted and regulated before the eggs are put in, and in most cases there will be little variation throughout the period of incubation. A machine which must be looked after during all hours of the night, as well as during the daytime, is a nuisance and undesirable.

To sum it all up, good, reliable equipment is absolutely necessary for profitable poultry raising.

CHAPTER XI

NATURAL INCUBATION

INCUBATING eggs in the natural way requires some study on the part of the amateur poultry raiser. The first essential to success is the selection of a reliable brood hen and the construction and location of a suitable nest. Every "clucky" hen is not always to be depended upon, and therefore care should be exercised in making the selection.

Nonsetting varieties of fowls such as Leghorns, Minorcas, etc., may, when in too fatty condition, show signs of being clucky, but they cannot be depended upon to carry the work of incubation to a successful conclusion. Select a hen from a breed which is known to be a good broody variety, such as the Rhode Island Reds, Plymouth Rocks, Wyandottes, Orpingtons, etc. Do not select the heavy, feather legged varieties, such as the Cochins or Brahmas. They are as a rule too clumsy and very apt to break some of the eggs or trample on the chicks when hatched.

The next important detail connected with this work is the construction of a suitable nesting box, not necessarily ornamental, but one which will assist the hen in her endeavors to rear a family of healthy chicks. Choose a box which is roomy

and quite deep, so as to give the hen plenty of room to change her position on the nest without breaking some of the eggs. Have it deep so that the nesting material will not be so easily carried out. It is a good idea to coat this box with whitewash or wash it with a strong solution of disinfectant. Either application will make the box both sanitary and mite proof.

The next step is to prepare the nest, which is also a very important matter. Place a few inches of damp soil or sod, cut three inches thick, in the bottom of the box, upon which should be placed a good thickness of clean straw or sweet hay.

Place the nest box away from the balance of the flock, so that the cluck will not be disturbed by the rooster or other hens. If possible select a secluded spot away from dogs and other things which may molest her. The best plan I know of is to have a small building constructed for this purpose, and arranged in such a manner that it will be possible to set a half dozen or even a dozen hens at the same time. It is much better to set several hens at the same time, and thus have several broods of the same age. By following this plan it offers the operator a chance to switch the chicks from one hen to another if such a thing is necessary. Another advantage in setting more than one hen at a time, one may have a small hatch from one of the hens, and in that case the small brood can be added to

another hen's brood to rear. It is also very advisable to have the flocks of chicks of as uniform an age as possible.

A medium sized hen can cover from nine to fifteen eggs. This same hen can cover six or seven turkey eggs, nine to eleven duck eggs, and four to five goose eggs. Bantams as a rule can only cover eight to nine of their own eggs.

Nest boxes for setting hens should be constructed in such a manner that they may be opened or closed as necessity demands. Before setting the hen the nesting material and boxes should be well sprinkled with insect powder. This operation should be repeated at intervals of eight days during the progress of the hatch, thus assisting the prevention of lice and mites. A dust bath should also be provided in easy reach of the broody hen.

It is advisable to keep the hen shut up in the nest, allowing her to come off for feed, water, and dust bath. If the hen is restless darken the nest as much as possible and locate her where she will not be disturbed by any one or anything.

When the hen leaves the nest for her daily feed, examine the nest for broken and soiled eggs. Foul eggs will affect the hatch. Feed the hen on hard grain. Soft feed and wet mashes produce bowel trouble. Always feed the grain in hoppers and supply the hen with fresh water from a clean vessel.

The period of incubation for fowls is twenty-one

days, for ducks, turkeys, and guineas twenty-eight days, and geese from thirty to thirty-five days. Small active varieties of fowls, such as Leghorns, often hatch in less than twenty-one days. Hatches may be delayed a day or two by the action of the hen. She may not sit on the eggs closely the first day, or she may forsake the nest too long during the hatch. The latter may also cause weakness in the chicks. During cold weather the eggs may be chilled in fifteen minutes, while in warm weather the hen may forsake her nest for hours without materially affecting the hatch.

To secure the best results from natural incubation care must be exercised in selecting the right kind of broody hen and in the selection of eggs. Then one must pay every attention to the setter's welfare during this trying period. The best and most diligent setter can be spoiled by neglect, and many a poor hatch can be traced to carelessness on the part of the operator.

An important point in selecting a setting hen is to choose one which is quite tame. Wild hens are apt to break some of the eggs by becoming startled from the least noise, or by jumping from the nest when approached. As a rule the old hens make better setters than the pullets and should have the preference when the selections are made.

Before the hen is placed upon the nest she should be treated to a thorough dusting with some good

reliable insect powder. Hold the hen by the legs with your left hand and lay her breast upon a piece of paper. Sprinkle the powder with a dusting gun or from a perforated tin box into the feathers, rubbing it in well as you go along. Cover every part of her plumage, under the wings, on her back, around the vent, and in the hackle. Hold the hen down for a minute or two so that the powder can take effect and to prevent the hen from shaking the powder off. By laying the hen on a piece of paper all the powder which has fallen off can be again used, thus saving considerable from each application.

Never set the hen upon the good eggs until she has been thoroughly tested out. Put her on some china or other dummy eggs for a few days at least and watch her actions closely during this tryout. Take her off the nest a few times and if she goes back and sits closely you may put in the good eggs and start operations. This plan is a protection to the poultry raiser, as some hens will at times show signs of being clucky and then quit again within a few days. My idea is to try them out for five or six days before counting them as safe.

Hens proving reliable setters should be marked, so that they may easily be recognized when they again become "clucky." The best way to mark them is to band them and keep a record of the band number.

It often pays to keep the good setters from one season to another for several years at least.

Always supply the cluck with plenty of fresh water, whole corn, grit and charcoal. Have these placed conveniently to the nest so that the hen will find them promptly when she leaves the nest. She should also be provided with a dust bath which will assist in keeping down the vermin and keep her healthy.

Always bear in mind that upon the care of the setting hen depends much of the success of the hatch.

CHAPTER XII

ARTIFICIAL INCUBATION

HATCHING the artificial way is, with the present day efficient incubators, simple to carry on successfully, and offers many advantages over the old way, the clucky hen. Of course there are exceptions; for instance, the poultry keeper who cares to hatch only a few sittings and the one who owing to circumstances has not the proper location for such a machine. Aside from these few exceptions every poultry raiser should use an incubator.

A good incubator requires very little time and attention. When once set and adjusted it will regulate itself, and all the time necessary to be devoted to its proper operation is a few minutes each morning and each evening. I say good incubators, because there are machines made and sold which need almost constant watching. Such machines are a nuisance, and are the cause for decrying of incubators by some people.

Before buying a hatching machine and risking your good money and valuable eggs therein, it is well that you study and investigate the merits of the incubator you have in mind. Do not be misled by the advice given by some writers that every incubator is all right if it is run right. True, the

proper operation of an incubator—a good incubator —has much to do with the results, but on the other hand the operator may follow the directions to the most minute details with an improperly constructed machine, and the hatching results will still be far from satisfactory.

There are two general methods used in heating the egg chamber—hot air and hot water. There are good machines made with both systems, and both have their friends and advocates. Some manufacturers make both kinds, and put it up to the poultry raiser to do the choosing. The large incubators hatching thousands of eggs are all hot water machines, and are operated from one heating stove.

The regulator is the most important part of a good hatching machine; upon its accuracy depends the uniformity of the heat in the egg chamber. A poorly constructed regulator is difficult to regulate, and is liable to fail in performing its function at the most critical time of incubation. A good regulator must be sensitive and at the same time be so constructed that it has the proper amount of durability.

Another feature which is important in an incubator is the construction of the box itself. It must be built so that it will retain the heat, and if made of wood it should be well seasoned lumber, properly matched, thus eliminating the danger of warping.

A machine properly constructed to retain the heat will also require less oil or gas to operate, and is not quite so much affected by the changes in temperature in the operating room.

The most difficult problem confronting the operator is the moisture question. My advice on this point is to follow the directions given by the manufacturer, in addition making due allowances for conditions and location of incubator. A good hygrometer will assist materially in determining whether or not you have the proper amount necessary for best results.

Where the heat is supplied by lamp, care must be exercised to use one which is not defective. The burner must be in perfect condition and the wick must be kept properly trimmed. A common mistake made by inexperienced operators is to turn up the wick too much, thinking they can heat the machine more quickly at the start, but the result is a smoked-up machine. Do not try to force the machine; it may take a little time to get the egg chamber properly heated but it is the only reliable way to get the machine under way.

Poultry raisers who have gas piped upon their premises should by all means use it instead of oil; it is cleaner and saves lots of work. In some of the smaller towns it may happen that the pressure on the gas is not always the same, hence I would advise making a thorough test before going to the expense

of making the necessary connections with the feeding pipes. Some of the larger poultry farms have small gas plants of their own, from which they heat the incubators and indoor brooders. Electricity is also used to a limited extent for heating incubators and indoor brooders, in which case special machines built for this purpose must be obtained.

There is one thing in connection with the successful operation of an incubator which must be perfect, and that one little thing is the thermometer. An inaccurate instrument will cause all kinds of trouble, and is ofttimes the direct cause for unsuccessful hatches. Be sure the thermometer is not cracked and that it has been properly tested. Another good idea is to have an extra thermometer on hand at all times, so as to be prepared in case of a break or something going wrong with the one in use.

Never use a cheap, inferior oil; it is poor economy. A low grade oil is liable to make the lamp smoke, and will not give the nice, even flame of the better grades of oil. Always use the best to be had, and be on the safe side.

Great care should be exercised in selecting eggs for hatching, whether they are to be set under a hen or placed in an incubator. To obtain the best results eggs must be obtained from healthy, vigorous breeding stock, and must be freshly laid, two weeks old being the limit. The best temperature for keeping eggs is from 40 to 65 degrees, and if an incu-

bator is used, it is advisable to turn the eggs every day.

It is better to select eggs of a uniform size for each setting, and all other eggs should be discarded. Some breeders even go so far as to advocate setting eggs of only one variety in a machine at a time. This theory may hold good in some cases. For instance, the eggs of Leghorns, coming from vigorous stock, will hatch a day sooner than eggs of the heavier breeds. On the other hand, I know of successful hatches in incubators containing both hen and duck eggs. One poultry raiser I know of set a machine with seventy-five hen and forty duck eggs, from which he hatched sixty-eight chicks and thirty-seven ducklings. The duck eggs required four weeks for incubation. They were put into the incubator a week before the hen eggs, so as to make the hatch come off more uniformly.

In setting an incubator avoid overcrowding. It is sometimes very tempting to put some eggs on the top of a full tray, but in nine cases out of ten it turns out very unsatisfactory.

Before placing the eggs in the incubator have the machine regulated and in good running order. After the eggs have been thoroughly warmed a little adjustment of the regulator may be necessary, but not enough to cause much alarm.

Many beginners make the mistake of not reading the manufacturer's directions for operating the

machine. They overlook something, and generally it turns out to be one of the most important details. All machines are not run on the same principle, and if the closest attention is paid to the manufacturer's instructions, giving careful attention to every detail, you will get better results.

A point very often overlooked is the regular trimming of the wick and keeping the burner clean. Some of the other things that cause the lamp to smoke are cheap, inferior oil and setting a machine in a direct draft.

Tampering with the incubator while it is in operation has caused many a disastrous hatch. This same overanxious, meddlesome operator would have the same result with setting hens because he would pester them also. When a person declares he can't get results from setting hens, the chances are that he will not be much of a success as an incubator operator. The most successful operator is one who carefully looks after all the details necessary to operate and then trusts the machine to do the work.

Do not neglect turning the eggs twice daily after the second day, and continue doing so up to the eighteenth day. After that the machine should not be opened for any purpose whatsoever until the hatch is complete. Keep the chicks in the incubator until they are perfectly dry, then remove them to the brooder. The opening of the incubator door has

caused many chicks to die in their shells. "Hands off" until the machine has finished its work is good advice to follow.

Incubators which have been stored away during the off season need special inspection. It often happens mice will find an inviting place in some part of the machine, and in some cases will fill the heating tubes with nesting material, causing lots of trouble to the operator when the lamp is lit for the first run.

The lamp should also be tested; the bowl may have sprung a leak, or a new burner may be necessary. The regulator should be carefully gone over, it might need some balancing or possibly a little repairing in order to make it work perfectly.

From an economical standpoint the incubator is preferable to the hen. Hens when hatching and brooding the chicks do not lay, and it takes from ten to a dozen hens to take care of as many eggs as one 150 egg incubator, whereas such an incubator can be operated for about $1 for the three weeks' run. The loss of eggs from ten hens would exceed this amount, not figuring the difference in the labor of taking care of ten broody hens and one good incubator.

If the eggs are all right and the machine is run right, most any one can hatch chicks "the artificial way."

CHAPTER XIII

ARTIFICIAL BROODING

ARTIFICIAL brooding of chicks presents similar problems to artificial incubation. The general principle is to substitute in an artificial way the same heat supplied by the hen. Although it does not require as uniform a temperature as does incubation, still there must not be any too marked changes. To almost roast the chicks part of the time and then chill them the balance of the time is bound to produce bowel trouble and death. Variations in the heat to a reasonable extent will not do much harm, but it is best to have the brooder regulated so as to maintain a uniform temperature throughout the day and night.

Most of the good brooders heated by lamp have a regulator attached, very similar to that used upon incubators, and with such an arrangement the degrees of temperature can be easily kept at a uniform point. Such brooders require less watching and save considerable labor to the busy poultry raiser.

Brooders must be properly ventilated, and to secure that degree of ventilation necessary without seriously affecting the temperature is a problem which ofttimes presents itself to the inexperienced

poultryman. The tendency is to overcrowd the brooders, and to overcome this crowded condition more and larger openings must be made to permit free passage of fresh air, hence the temperature of the brooder is more difficult to regulate, and in some cases it is almost impossible to do it.

Overcrowding the brooder is about the worst mistake one can make. This practice results in heavy losses, and a weakening condition to those who are fortunate enough to withstand this hardship. In many cases the blame for this overcrowding on the part of the inexperienced operator can be laid at the doors of the manufacturers of some of the brooders, who in their desire to outdo the claims of their competitors in the same line of business, overrate the actual and safe capacity of their brooders. Thus the novices, who are not versed sufficiently on the subject of artificial brooding, are misled by the very people with whom they place their confidence. It is unjust on the part of the manufacturers to misrepresent such an important factor as capacity, and I believe it will react upon them in the end.

When the brooder is overcrowded and the chicks die in large numbers, in many cases the blame is placed upon the brooder, hence the manufacturer loses both the friendship and future orders of the imposed upon poultry keeper.

Another fact which is not always taken into con-

sideration is the growing of the chicks. A brooder may be sufficiently large to take proper care of, say, 100 chicks during the first week of their existence, but in a few more weeks this same lot of youngsters would be of such a size that the capacity of the aforesaid brooder would be inadequate to hover such a number properly without being very much overcrowded. A little common sense used on such subjects will overcome lots of disappointments and losses, and although it is best to follow the manufacturer's directions as much as possible in the operation of a brooder, it nevertheless is advisable to use your own judgment as well.

Most any one, no matter how inexperienced, should be able to note when the brooder is overcrowded, and when the little fellows seem to be uncomfortable. At the first appearance of crowding the flock should be divided, and some of them put into another brooder. To endeavor to save on equipment, space, and labor at the expense of the health of the chicks is indeed poor economy, and will prove costly in the end. If you cannot afford to purchase the necessary brooders to take the proper care of your incubator capacity, it would be to your interest to set less eggs and thus eliminate the possibilities of heavy losses in the chicks, and impairing the health of the entire flock of youngsters. Many a novice has made this mistake, and in almost every case has paid dearly for it.

The novice should heed the oft repeated assertion, "It's easier to hatch the chicks than to raise them." Good eggs placed in a good incubator run properly or placed under a hen will hatch, but to properly care for the little creatures presents a more difficult problem. To properly care for chicks means to supply them with the things which nature intends they should have to promote their health and growth.

Warmth is the first essential to their welfare. When hens are used to mother the broods there will be no trouble in this direction, unless perhaps too many chicks are placed in their charge, but where the artificial methods are used improper temperatures are apt to cause many losses before the causes are detected by the inexperienced. The low and irregular temperatures of brooders have caused more cases of diseases and deaths than any other one thing in the artificial brooding of chicks.

First of all the novice should install a brooder which will meet his particular case. What I mean by this is he must pay some attention to where the artificial mother is to be located, whether in a warm room, a fairly warm henhouse, or in the yard. There are heated indoor, heated outdoor, and fireless brooders; all have their advocates. It would be far from practical to put a heated indoor or a fireless brooder outside during the early part of the season, nor would it be economical to purchase

an outdoor heated brooder for indoor use. These things must all be taken into consideration when the equipment is obtained.

One of the late inventions along this line is a portable hover which can be used in a warm room during the early part of the season, and as weather conditions improve it can be installed in a colony house or some other unheated building. I believe that this style of hover will be popular, as it can be moved from place to place as occasion demands, necessitating only one style of equipment for both indoor and outdoor use.

Before taking the chicks from the incubator and placing them in the brooder it is advisable to operate the latter for a day or two, so as to have it heated up and properly regulated at about 90 degrees. When the chicks are then put in the temperature is bound to rise, and care should then be taken that it does not go much above 98 degrees, which temperature may be retained for the first week. The second week the temperature should be reduced to about 90 degrees, the third week to 85, and after that about 80 degrees as long as the chicks need brooding. An outdoor brooder will need to be regulated with weather conditions; cold nights should be especially guarded against.

Chicks not supplied with the proper amount of artificial heat will crowd, no matter how few are placed in the brooder. It is instinctive for them

to huddle and endeavor in that way to keep themselves warm. When the proper amount of heat is given to the chicks they will invariably spread out on the floor of the brooder and be contented. Crowding will result in some being trampled to death, while others will be retarded in their growth, or possibly become affected with white diarrhœa.

Keep the brooder heated until the chicks get so far developed that they no longer care to go under the hover, when they may be removed to the colony houses to make room for another brood. Some make the mistake of taking the heat away from the chicks too soon, with the result that they will have a lot of stunted chicks. Leave it to the chicks to decide when they should be taken from the brooder, and you will always be on the safe side.

Cover the bottom of the brooder with short cut alfalfa, clover, or fine cut straw, which should be removed when it gets soiled, the bottom sprinkled with a good disinfectant, and a new bedding put in. Some also use dry dirt and sand for floor covering.

Feeding is an important factor in the successful raising of chicks. For the first thirty-six hours the newly hatched need no feed at all, as the yolk of the egg is absorbed, furnishing them with sufficient nourishment. After this period has elapsed give them a supply of fine grit and charcoal, and if possible feed them some hard boiled eggs. The

infertile eggs from the incubator may be used for this purpose. Then feed them some good commercial chick food, or if this is not easily obtainable, give them a mixture of steel cut oatmeal, millet seed, and fine cracked corn.

Never feed any sloppy, wet feeds, as it has a tendency to cause bowel trouble. Give them plenty of milk or water to drink and keep the vessels clean, a scouring each day will not take much time and will be a precaution against disease.

Give the chicks plenty of green food, sprouted oats, or tender grass, also some fine beef scraps, or some raw meat cut up fine. They relish the latter and it does them much good, serving the same purpose as insects.

Keep the little ones busy by feeding the ground grain feeds in the litter, and feed them four or five times daily.

If the foregoing advice is closely followed the amateur poultry raiser will have little trouble in raising a flock of healthy chicks and developing them into vigorous pullets and cockerels.

If a common, ordinary shallow dish is used the chicks will invariably hop into it, not only continually getting their feet wet but also keeping the water so soiled that it is unfit to drink. An automatic water fountain will prevent this, and is the only device which should be used on a well regulated poultry plant. There are many kinds upon

the market which can be purchased at a nominal price, but those who cannot afford to spend any money on such devices can with little trouble make one. Take an empty tomato can, or any kind of a fruit can, for that matter, scour it out thoroughly, punch a small hole (about a quarter of an inch will do) close to the bottom, or open end. Fill the can with water, place a saucer, or other shallow dish, over it, hold the dish tight, and then revert, so that the saucer will be on the bottom.

Only enough water will come out of the can into the saucer at a time to cover the space up to the top of the punched hole, thus giving an automatic drinking fountain. Do not use a leaky can, as it must be perfectly airtight on top, otherwise all of the water will come out at once. Care must also be taken not to punch the top of the hole higher than the depth of the saucer, or the fountain will overflow. This kind of fountain is easily cleaned, cheaply constructed, and answers the purpose for which it is intended.

CHAPTER XIV

DEVELOPMENT OF CHICKS

UPON the activity of a brood of chicks depends their rapid growth and development. Chicks which are not active will not take to the food as they should, nor will they develop their tiny muscles to such an extent as to give them the proper amount of bodily strength. Good appetites mean healthy chicks, and healthy chicks are bound to grow.

Keep the chicks moving and don't bridle them up in a small space where exercise is impossible. When chicks are about ten days old they should have access to a run, not necessarily a large run, but one sufficiently roomy to permit them to scratch and play. Cover the floor of this run with an abundance of chaff, short cut alfalfa, cut clover, or some other similar material which gives them something to scratch in. If the dry grain feeds are scattered in this litter you may rest assured the little fluffy fellows will do their share of scratching. It is very interesting to see them work, digging down in the chaff and throwing it all about them and enjoying the grains when they get them. It denotes life in the little flock and makes one feel that they are contented and happy.

Another good form of exercise is to hang up a

head of lettuce or cabbage and make them jump up for their green food. They will also enjoy jumping at a peeled apple suspended by a cord. A little fine chopped up raw meat thrown in the run, a little at a time, will make them scamper about like a bunch of football players in full action.

When the weather is pleasant and chicks are a few weeks old they should be given outdoor exercise on dry ground runs, and later in the season on grass runs if such a thing is possible. Chicks can be reared up to nine and ten weeks on board runs, and many are raised every year without being put upon the ground at all, but experiments along this line have shown that chicks given ground runs are hardier and healthier than those denied nature's earth to run on. Their special delight seems to be to dig into freshly turned soil. For hours they will scratch in this fresh earth, and no doubt they find many things which are beneficial to them and which are not supplied in their regular rations of feed and grits. The fresh air and the sunshine they get out in the open are also very essential to their growth and development. Of course it is understood that the chicks should be kept in during rainy and damp days, or when the dew is heavy on the grass in the morning. Dampness is liable to cause leg weakness or bowel trouble, two very much dreaded diseases among poultry breeders.

Lice on growing chicks will also retard their

growth and development. But lice come from neglect. Careful, painstaking poultry raisers are seldom troubled with these pests to any great extent. At any rate they do not get a hold upon their flocks.

Filthy and poorly ventilated houses will also undermine the vigor of the growing pullets and affect their laying possibilities. Cleanliness means dollars to the poultryman.

Many pullets get their first setback in improperly heated, crowded, or poorly ventilated brooders. Some persons hatch more chicks than they can properly take care of with the brooding equipment at hand. They take a chance and pay the penalty not only by losing many of the chicks, but also by affecting the vitality of those birds fortunate enough to pull through. The profits are not in what you hatch, but in what you raise to maturity.

Figure your capacity correctly and see to it that your brooder outfits are in keeping with your incubator capacity. Of course the one who uses the old hen to do the work need not figure these things; his or her worries will come later when they have eggs to set and no clucky hens to set them under.

The average weight of a newly hatched chick is about one and one-quarter to one and one-half ounces. In three or four weeks it should weigh one and one-half pounds; at six or eight weeks a pound; nine to eleven weeks, two pounds, and at three months it should be up to two and one-half or

three pounds. From then on the youngster should gain about a pound a month until six months, when it should have its full growth.

Chicks raised on range, when taken from the brooder, should be provided with movable colony houses, holding 50 chicks each. These houses should have open fronts, and should be placed facing the south. The open fronts should be protected with some kind of an awning, or built in such a manner that the heavy rains cannot blow into the interior of the colony houses.

CHAPTER XV

WEANING THE CHICKS

WEANING time is the time to take the chicks away from the "clucks" or brooders, as the case may be. The weaning process should start at the age of 6 to 8 weeks, or better still when the chicks show signs of wanting to roost on the top of the hover or other places about the brood coop. In most cases the chicks themselves will indicate to you when they are no longer in need of heat and mothering.

When these signs are apparent they should be removed to new quarters arranged for them. Comfortable houses should be provided for their reception. When I say comfortable I mean everything the word implies, everything necessary for their health and to promote their growth.

Any old house or box will not do. It must be waterproof, so as to keep out the hard summer rains, not only from the top, but also from the sides. Face it to the south or east, never to the north or west. Provide plenty of fresh air by having the front as much open as possible. Growing stock reared in open front houses will develop into hardier fowls than those too closely housed. Fresh air and plenty of it, both during the day and at night, is an absolute necessity to proper development.

Have the houses built of a size in keeping with the number of birds to occupy them. Overcrowding is bound to result in trouble for the operator — the stunting of the chicks, disease or deaths. Have the front so arranged that the sun will penetrate almost every part of the house at certain times during the day. Plenty of sunshine with good ventilation will do more to keep away disease than all the disinfectants on the market.

These houses should have removable roosts, built rather low, so that the young stock will have no difficulty in getting on to them, and also preventing the danger of injuries to their feet from too high a jump on the hard floor below. I recommend removable roosts to facilitate the cleaning of the houses.

Before the chicks are removed to the new quarters, the houses should be given a thorough whitewashing, thus making them sanitary and almost vermin proof. The chicks should also be closely examined for lice before occupying the new homes, and at the least sign of any vermin they should all be well dusted with insect powder.

Do not give the growing chicks any opportunity to roost upon the cross studdings. If such are used in the construction of the house cover them with a slanting piece of wood which makes it almost impossible for them to perch on. The roosts should also not be round, as such roosts are apt to cause crooked breastbones. Always use flat roosts about

three inches wide, and of sufficient capacity to accommodate the number of chicks comfortably, allowing plenty of room for them to grow.

The trouble with many amateurs is they do not figure on the chicks' growth and development. The house seems large enough when the chicks are placed therein, but soon it shows signs of being too small. Remember, do not build for today, but build for three months hence. It is better economy to have it a little too large than too small.

As a floor covering for these growing houses I strongly recommend clean sand. If this is scattered about to a depth of about two inches it will readily absorb the droppings, keeping the houses in a more sanitary condition than if the droppings are permitted to fall upon the bare floor. If this sand covering is raked thoroughly twice a week it is not necessary to replace it more often than twice a month.

Where space is limited and the growing stock cannot be given free range runs must be provided of sufficient dimensions to afford the chicks exercise. These runs must be provided with plenty of shade. Small trees, bushes, or shrubbery are the best for this purpose, but where these cannot be provided a canvas or board covering should be constructed at one end of the run.

The drinking vessels should always be placed in the shade and the water therein should be renewed

at least twice a day during the summer months. Clean drinking vessels with plenty of fresh water will assist greatly in keeping the flock in the best condition during their growth.

Spade up some of the soil in the runs and give the chicks a chance to scratch and wallow in it. They will find many things in that freshly spaded soil which cannot be supplied to them in an artificial way.

Kill the cripples and sickly looking specimens; they will never amount to much and are only in the way of those that are growing and doing nicely.

CHAPTER XVI

FEEDING THE GROWING STOCK

DON'T be hasty in feeding the growing stock the larger grains. The comparative cheapness of whole corn and oats to that of the mixed chick foods offers temptations to the amateur to rush the feeding of the chicks. To pursue such a policy will result in retarding the growth, and in many cases disease and death will follow in rapid succession.

The smaller grains are more easily digested, thus assisting nature greatly in its work, and eliminating to a great extent the possibility of sour crop and indigestion. Of course it is understood that when the chicks are considerably advanced they should not be fed on the smaller chick foods, but should be put upon the coarser grades.

A good reliable growing mash should also be fed from a trough or dry food hopper. This can be placed before them at all times as the chicks are not very apt to eat too much of this dry fine mixture at any time. Never feed any wet, sloppy mashes of any kind to the growing stock, as they are unnecessary and dangerous to the health of the flock. Dry wheat bran makes an excellent feed for the growing stock, and can be fed in unlimited quantities.

Keep the chicks well supplied with granulated

bone, charcoal and beef scraps. The latter must be fresh and free from any musty odor. Much damage has been done in growing flocks from the feeding of poor dry beef scraps, and great care should be exercised in purchasing this article. Charcoal is one of the most important things to have about the poultry yards, notwithstanding the claim of some poultrymen, who say it is unnecessary when the fowls and chicks are given the proper foods in the right proportions. It keeps the gases down and assists digestion, preventing many cases of bowel trouble, and other diseases. My advice is to keep charcoal before the birds at all times.

Meat in some form must be fed to poultry, they must have animal matter. Fowls running on free range where insects are plentiful obtain a sufficient supply of animal matter, but those kept in closer quarters must be given this food in another form. Finely chopped fresh meat is an excellent bone and muscle builder for the young stock, but should not be fed more often than two or three times a week. Green bone cut freshly just before feeding, is equally as beneficial but must also be fed with judgment as to how much and how often. Meat foods assist feather, bone, muscle and comb development, consequently too much is very apt to cause too much forcing along these lines.

The poultryman who is careless in his purchases is liable to get a supply of grains which are too fresh

for immediate feeding. Grains of all kinds should be fairly well seasoned before they are given to the stock, especially the growing chicks. Unseasoned grains cause bowel trouble and indigestion. Those who have the room should lay in a supply of old grains before the new crop is put upon the market, thus avoiding all dangers of being forced to purchase the newly gathered crop. New wheat and new corn are more dangerous than the other grains and should be especially avoided.

The growing stock must have lots of green food. Give them all the lawn clippings, lettuce, beet tops, mustard plants, or sprouted oats they will eat. Birds in confinement must be supplied with these necessities, they are absolutely necessary to the proper health and development of the flock. Raw potatoes or potato peelings are also good.

Do not throw out the sour milk, give it to the chicks; it is a very valuable food for them, and much relished. Skim milk or buttermilk is also very good.

CHAPTER XVII

BUILDING THE FRAME

In raising chicks for the market it is absolutely necessary to build the frame before putting on the fat. Inexperienced poultry raisers often start their chicks with too much fat forming food, containing a very small percentage of ash and protein. The growing chicks must have the frame, bone and muscle to carry the fat, without these the result will be leg weakness and other ailments, and in many cases the retarding of the growth. It is only reasonable to build the foundation first before going on with the rest of the structure. A chick with a proper developed frame, well formed bones and good muscles will take on fat readily when the time comes for such development.

Do not attempt to crowd matters along this line, go about it systematically, build up from the bottom, and put on the finishing touches when the time is at hand to do so. It is possible to force a chick, but that forcing must be done first on the bones and muscles, and then the fat. Remember, the frame must first of all have the carrying capacity, or there is sure to be some kind of a breakdown. Sometimes these breakdowns will not be in evidence at the beginning, but later on they will surely crop out.

Many broods are started with too much corn meal, and later too much cracked corn in their grain foods. Corn contains a very small percentage of ash or mineral matter, very little protein, and a very large percentage of carbohydrates, as a fattener it is excellent but as a bone and muscle builder it has very little value. I do not wish to leave the impression not to feed any corn to the growing chicks, but what I wish to convey to the amateur poultry raiser is the danger in feeding too much corn, or for that matter too much of any food which contains too much fat forming substances. Americans and especially the farmers rely too much upon corn as a food, and the low price, compared with other grains grown upon our farms offers an incentive to use it more freely. To feed lots of corn because it is cheaper will in the end prove to be poor economy, and such a policy of saving is condemned by every experienced poultry raiser.

Strength and vigor must be in the chick when it is hatched, but that strength and vigor must be encouraged and must grow with the development of the chick. No matter how healthy and strong the chick may be when hatched, the strength will soon disappear when not given the proper feed and attention. It is much easier to run a flock down than to build it up, and nothing will run down a flock of chicks quicker than improper feeding.

Oats and wheat contain a good percentage of the

elements necessary to build bone and muscles, the former especially is one of the very best poultry foods to be found. To the oats and wheat may be added kaffir corn, millet and some cracked corn, all of which combined forms an excellent grain food for the growing chicks.

Wet mashes containing boiled potatoes and other starchy foods are also condemned as a food for the growing chicks, as they are very fattening and very apt to cause bowel trouble and indigestion. Personally I am very much opposed to feeding any kind of wet mashes at any time; as experiments have shown that dry mashes produce better results with less danger of the birds overeating, and practically no danger of sour crops or bowel troubles originating therefrom. A mixture of bran, middlings, ground oats, mealed alfalfa, to which may be added when fed some high grade beef scraps, makes an ideal dry mash for the growing chicks, and although this is not a forcing food it assists materially in building up the chicks and developing them as quickly as nature intended them to advance.

The evenly, steadily growing chicks are the ones that make good, and are superior to those that have been forced in development.

CHAPTER XVIII

CONSTITUTIONAL VIGOR

WHETHER we breed fancy, utility, or mongrel fowls there should be a constant endeavor to build up the flock if we expect to attain success. Probably I should have left the mongrel hen out of consideration, though I have known mixed flocks that gave a good account of themselves. But as a rule, when a person gets to the point where he or she is sufficiently interested in the hens to improve them, it does not take long to be convinced that if there is to be any marked improvement pure bred fowls must be kept.

The breed matters little, being largely a matter of personal preference. What is most important is the constitutional vigor of the flock, and that is a matter of careful selection, breeding and care.

This care must be exercised first by the beginner in the purchasing of the breeding stock, baby chicks or the eggs, and this same careful selection for hardiness and vigor must be continued during the future operation of the poultry plant. A flock may easily deteriorate and not be profitable.

To accomplish the greatest amount of good in building up the flock it will be necessary to start with the chicks from the time they are taken from the

incubator and keep them steadily developing. Not alone this, but the process of elimination must begin early.

Few poultrymen have the courage to cull as closely as they should, and this is more nearly true of the great number of nonprofessionals, who have small flocks. Some will take the weak and sickly chicks from the incubator and by coddling and doctoring them possibly save their lives, but seldom do such chicks amount to much in the end. Who would care to buy chicks from such stocks?

It is better by far to kill all the weaklings and cripples as soon as they are discovered. It is much preferable to have less chicks and have them vigorous and healthy, thereby assisting to build up the flock.

Give the chicks every attention during the brooder period, feeding regularly the first few days, and looking after their every want. Feed them good clean commercial chick food, composed of small grains, and a dry mash of wheat bran and middlings. Supply them with plenty of fresh water, grit, charcoal, and a little meat in some form.

In order to produce strong, healthy hens there must be no check to the chicks' growth, but, on the other hand, it is not advisable to force them. Pullets may be hastened to maturity and their laying stimulated in various ways, but it will surely weaken the constitution and destroy the hen's value as a breeder.

A good steady growth is more desirable and will win out in the long run.

After the chicks have passed the brooder stage give the youngsters a roomy coop and a run, so as to give them exercise. Give them plenty of green stuff and animal matter. Keep the coops and runs clean — filthy quarters will breed disease and vermin. Coarser grains should then be fed.

Throughout the summer the culling process should continue if the flock's standard is to be materially raised. As the chicks grow some will show imperfections, and these should be culled out as soon as possible. Those having crooked tails or bones should not be retained in the lot. These defects are not always transmitted to offspring, but no chances should be taken on this score. Besides, such specimens detract from the general appearance of a flock. The defective birds, along with the undersized ones, should be put into the fattening pens preparatory to being used for the table or market.

If the breeder will only study his flock, going over them carefully and retaining only the best for future breeding, the standard of the flock will be increased each year, and this improvement will increase the earning capacity of the plant.

CHAPTER XIX

SUMMER MANAGEMENT

SUMMER is always a busy time in the well regulated poultry yard. The stock, both old and young, must receive special attention. Hot weather breeds both lice and disease, unless every precaution is taken to prevent their appearance in the flocks.

A little neglect during hot months is very apt to cause the poultry raiser much trouble. A few hours' extra work now may be the means of saving many hours of work and anxiety later, not to mention the losses in dollars and cents.

Don't be unmindful of the fact that thousands of chicks and grown fowls succumb during the hot months from the ravages of insects and disease. A large percentage of this mortality could be overcome if more vigilance were exercised by many of the poultry keepers.

Filthy quarters during warm weather are bound to result in trouble. Heat and filth play hand in hand to increase vermin to an alarming extent and under such favorable conditions it is difficult to arrest their progress. Let the vermin once get a good start and the work of extermination means a hard fight and a persistent one. The experienced poultryman needs no warning, he knows too well

how rapidly these pests will increase and the damage they can do in a comparatively short time. Beginners are very often too slow to detect the presence of insects and when they are discovered they have gained a good foothold upon the flock.

In many cases the trouble originates with the setting of the hens. The inexperienced poultry raiser fails to dust these at intervals of a week during the progress of the incubation with the result that the hen comes off the nest with her brood of chicks loaded with lice, which in turn are transmitted to the chicks. A cluck setting on a nest does not have the opportunity to dust herself as frequently as the other hens, and this coupled with the fact that her body is possessed with a higher temperature makes the conditions more ideal for the propagation of vermin.

Those who have started to combat vermin early in the season need not fear the ravages of these pests as much as those who have been neglectful in this direction, but nevertheless they must keep preventatives on the job at all times. Keep the houses exceptionally clean during the hot spell, disinfect thoroughly, change nesting material often, spray the nesting boxes, give the fowls free access to a dust bath, and examine the birds often. Should the poultryman notice the first sign of vermin, every bird should be taken in hand and thoroughly dusted with the best poultry lice powder obtainable. Another

advisable thing to do is to paint the roosts with a reliable lice paint, and the nesting boxes may be treated in a like manner.

Keep the poultry house free from any foul odors during the hot summer months. A good reliable disinfectant used properly will assist greatly in this direction. Air slaked lime swept over the floor and dropping boards after each cleaning will keep the house free from odors and act as a germicide, preventing disease and assisting materially in keeping down the insects. Every poultryman should keep a barrel of air slaked lime on the premises and use it freely.

Too much cannot be said about the drinking vessels. Many of the diseases infecting our domestic fowls come from unsanitary fountains. A drinking vessel cannot be kept clean and sanitary by merely washing it out with cold water, or possibly playing the full force of the hydrant upon it; it must be scoured often. A good plan is to dip it in a solution of disinfectant, or boil it out with steaming hot water to which has been added some soda. Drinking vessels require more care in summer than winter as the warm weather produces a more slimy settlement in the water.

Remember, clean, sanitary drinking vessels, clean houses, clean yards and a continuous warfare on vermin are essential to hot weather poultry keeping.

Have your poultry houses cool in summer,—it is

just as important and possibly more so than having them warm in winter. To confine fowls in hot poorly ventilated sleeping quarters during the summer night is bound to show its effects upon the breeding stock as well as the growing chicks.

I have found it very advantageous to have a wood or canvas awning over the windows during the hot summer days. It will assist materially to keep the house more comfortable,—shutting out the hot sun-rays and also affording a protection for the sudden heavy summer showers which may come on during one's absence from home. If the board canopy is used it should be attached with hinges, which makes it possible to be raised and lowered as occasion demands. Do not have the boards covered with tin, either have them made from matched flooring or covered with roofing paper. Tin will draw the heat from the sun, and I do not recommend it for any kind of poultry house coverings.

Poultry houses should be sunned out some during the day, but it is far from advisable to have the sun beat into it during the biggest part of the day, resulting in making the house more of an oven than a roosting place for hens. Remember the fowls feel the heat as much as human beings and it is necessary to assist them in keeping comfortable.

Poultry which is housed in cool houses at night, and given lots of shade to run under during the day, is bound to show better results for the egg basket.

Fowls which have been exhausted from the heat cannot be expected to be in the best laying condition.

Most of the hens have been hard at work during the spring months shelling out eggs, hence they need all the comfort possible in order that they may continue in their work. A good circulation of fresh air during the roosting hours can be provided at little or no expense, even though it be necessary to make several temporary openings for the summer months.

Poultry houses in which the windows are all placed considerably below the ceiling should have a ventilator at the extreme height of the building to carry away as much of the heat gathering above the windows as possible. It is well to protect such ventilators in such a way as to prevent the rains from blowing into them.

Many poultrymen have doors covered with wire netting, which are used instead of the wooden structures during hot summer days and nights. The wire doors will admit lots of fresh air, and at the same time keep out the prowlers of the night. It is not advisable to keep the doors open during the night without some kind of protection.

There are many other ideas which can be used to advantage in devising a way to keep the poultry houses comfortable, if the poultry raiser will only give the subject the amount of thought it deserves.

Change the water at least twice a day, and keep the drinking fountains in a shady place.

Do not feed too much corn, it is too heating, and has a tendency to make the hens "clucky."

Disinfect the poultry houses thoroughly at least once a week, use a sprayer for this purpose, as it can be done more effectively with such a device.

Change the nesting material often. Use clean straw well sprinkled with insect powder. The nesting boxes should also be treated with a liberal supply of disinfectant.

If possible gather the eggs twice each day so as to prevent any possibility of "clucky" hens setting on them for any length of time.

Do not permit your hens to roost out of doors because the weather is warm. It teaches them a very bad habit.

Dry bran and middlings are good feeds during the summer months. Always feed these dry, in a hopper.

Keep the grit boxes well filled with coarse, sharp grit, charcoal and oyster shells. Even though the hens have free range, it is advisable to have these necessities in boxes placed near the dry food hoppers.

Throw the lawn clippings into the poultry runs. Give the fowls all the green food they can eat.

Never use a drinking fountain which cannot be easily cleaned. Unsanitary drinking vessels are very liable to cause disease during the warm weather.

Lots of shade is the proper thing. To force the hens to take to the henhouse for shade during the

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hot summer days is a mistake and should not be tolerated on a well regulated poultry plant. Shade trees and small shrubbery are a valuable asset to a poultry run, but where these are not to be had, some kind of a shade shelter should be constructed. Some poultry keepers build the houses high enough up from the ground to permit the hens to run under the buildings for shelter.

Do not let the growing stock run with the laying hens. The chicks need different care and feeding than the old stock.

Remove the broody hens to other quarters as soon as they are discovered. A broody hen is liable to cause trouble in the laying hens.

Dig up the soil in the runs. It will do the hens good to wallow in the freshly turned earth.

If the runs are small, rake and clean them out often.

Do not set the hens in the hay loft, or in the garret, set them either on the ground or as close as possible to it. Soil helps to furnish moisture to the eggs, a necessity for successful hatching.

Do not keep the "mother" with her brood in a closed, stuffy box at night. Both the hen and the chicks need lots of fresh air.

If any of the hens should show signs of being off their feed give them a dose of epsom salts. It is advisable to put some epsom salts in the water now and then. Do not do this too often, once every two

or three weeks, during the summer months, is sufficient.

If you feed green ground bone be sure that it is freshly ground each day, as it will easily spoil during hot weather. Tainted meats or meat products are not safe to feed to poultry.

Farmers are very apt to neglect their poultry during the summer months, being busy in the fields. This is a serious mistake. Would these same farmers even think of neglecting the cows and hogs? Why, then, the poultry?

CHAPTER XX

BUILDING UP A LAYING STRAIN

BUILDING up a laying strain is a subject that is receiving much attention among the poultry raisers in these days of high prices for eggs. Experience has taught poultrymen the futility of haphazard methods formerly practiced in the selecting and caring of flocks. Proper selections in the breeding stock, coupled with correctly balanced rations and good care have brought about wonderful changes in the productiveness of the present day hen.

To build up a laying strain, man must assist nature; fixed methods must be used in the breeding; some system must be devised for the selection and good judgment used in the feeding. It requires study and work to bring about the desired results.

Every one who has had any experience with poultry knows that among hens of the same breeds, and even from the same parents, there is a difference in the productiveness. It is another case of proving that like does not always produce like. That is one reason good laying strains are not so easily made. The great stumbling block with the utility poultry raiser is the inability to distinguish between good and poor layers in a flock of otherwise healthy hens.

The average farm flock of today is not up to the

standard in productiveness because little attention is paid by the farmer to the selection of his breeding stock and in caring for his flock. Many a farm flock is compelled to work out its own sustenance. It must find its own feed and water, and do its own mating.

Such a farmer generally only thinks of the poultry when it is time to gather the eggs or catch some hens for market. Ask these same farmers what their poultry is doing and they will tell you they couldn't possibly give you an approximate figure as to how many eggs the flock has laid, or how much the flock has earned in dollars and cents, or how many eggs and birds were used on the family table. They cannot tell you the age of any of the hens, and generally do not know just how many fowls they have on the farm. They may also use the same male bird year after year, and keep every chicken that is hatched whether it was stunted in its growth or not.

These same farmers are the ones that ridicule the articles they read about some city man or woman making several hundred dollars each year from poultry raised in the back yard. If the egg market depended on such producers, eggs would certainly be a scarce commodity. There would only be breakfast eggs for the wealthy and the poor would go without.

Much study has been given to the development of the productiveness of our hens. State universities,

experimental stations, private individuals have spent time and money in carrying out experiments along this line. Such work has resulted in much good to the present day poultry raiser, and is assisting him greatly in building up his flock to a higher standard of productiveness. The various egg laying contests which have been carried on in different parts of the country have given to the public many facts showing what the American hen is capable of doing under the right conditions. We are just beginning to learn the value of the hen on our farms and in our back yards.

The introduction of the trap nest has been a great help to poultry raisers in selecting good layers. By its use the egg yield of every hen can be easily ascertained, and there is no more guess work necessary in finding out which hens really do the work. Trap nests make it possible to keep an accurate record of each individual hen. They are now quite extensively used throughout the country and are becoming more popular each year.

For the benefit of the beginner who, perhaps, does not know what a trap nest is and how it works, I will state that it is a nest box with a door on the front which works automatically in such a manner that it traps a hen as soon as she is on the nest and holds her a prisoner until released. When the hen is removed from the box the band number is taken and put on the record book for future reference. In constructing these trap nests great care should be taken

to supply plenty of ventilation, so as to add to the bird's comfort while confined therein.

Another factor which should enter into the laying quality of a hen is the time when she lays the most eggs. Winter eggs are, of course, most desirable, owing to the prices obtained at that time. It will thus be seen that it is not only advisable to pick the hen that lays the most eggs but the one that lays most during the cold weather.

If you want good, substantial profits from your poultry you must either buy your stock from a good laying strain of birds or else build up a good laying strain of your own. The extra time and money put into the business for that purpose will soon come back to you in the returns from the flock. A good paying utility flock is one that contains a good egg yield from every individual hen. Such a flock is possible if the trap nest is used and the selection is carefully carried out.

The poultry department of the New York State College of Agriculture at Ithaca has been doing some remarkable work in breeding for egg production. Among its flock fifteen hens averaged 236 eggs per year each, and twelve others averaged 182 eggs during their first laying year. In the former lot are two hens which have made astonishing records. Mme. Cornell, one of these hens, laid in her first year 245 eggs, which weighed 30.6 pounds, and Lady Cornell, the other hen, 257 eggs, which weighed 29½ pounds.

Lady Cornell is a single comb white Leghorn and only weighs 3.2 pounds, and by laying 257 eggs averaging 1.8 ounces each this hen's productive ability during that period was 9.2 pounds of eggs for each pound of her live weight. This is a remarkable performance. In this hen's second year she laid 200 eggs weighing 23.69 pounds, or a total egg yield for two consecutive years of 457 eggs weighing 53.19 pounds.

The wonderful showing made by this Leghorn hen proves the truth of Dr. W. H. Jordan's statement that the productiveness of the hen is greater than a Jersey cow in comparative live weights. Dr. Jordan, director of the New York experiment station, says: "If you take the dry matter of the hen and compare it with the dry matter in the eggs she lays in a year there will be five and one-half times as much dry matter in the eggs as in her whole body. The weight of dry matter in the cow's body to the weight of the dry matter in the milk will be as 1 to 2.9.

"In other words, based upon the dry matter, the hen does twice as well as the cow. I suspect the hen is the most efficient transformer of raw material into a finished product that there is on the farm. Her physiological activity is something remarkable. So in that particular the hen stands in a class by herself."

In terms of dry matter it has been estimated that

Lady Cornell weighed 1.4 pounds, that she consumed in one year's time 88.1 pounds and produced eggs containing 10.1 pounds of dry matter, or 7.1 pounds for each pound of dry matter in her body. These figures more than bear out Dr. Jordan's contentions.

A careful record was kept of this particular hen, her trap nest record, estimated amount of food she ate, labor required to keep her, and her earnings. It was estimated that she ate 110 pounds of food at a cost of $1.66; labor to keep her, 75 cents; and interest on investment, 25 cents, or a total of $2.66. The seventy-three pounds of manure were worth 29 cents. Her eggs were sold on the Ithaca market for $7.43, and this, added to the value of the manure estimated at 29 cents, would make a total of receipts of $7.72. It will thus be noted that the net profits from this hen were $5.06 for the year.

Although this showing made by a hen is phenomenal, it proves that such productiveness is possible in our domestic fowls and shows what can be done by careful selection, proper care, and feeding. It illustrates the evidence of human achievement in handling the forces of nature, the gradual evolution of the domestic fowl from the wild jungle fowls which laid only a couple of dozen eggs a year. What has been accomplished by Lady Cornell and her running mate, Mme. Cornell, can be accomplished by other hens.

Careful breeding, selection and feeding have made wonderful changes in our animal life. Nearly all our domestic animals and birds are descendants of a wild prototype — the horse from the wild horse of Central Asia, the dog from wolves and jackals, the many species of pigeons from the wild Blue Rock Pigeon, which abounds in Northern and Eastern Madeira, Canary Islands, India and Japan.

What is true of other animal life is also true of poultry. Our present day busy hen came from the wild jungle fowl of Northern India. The Gallus Bankiva, as this wild fowl is called, very closely resembles the Black-breasted Indian Game, smaller in size, and tail carried more erectly. It has required centuries of evolution to produce the many varied colored and shaped specimens of today. Even this remarkable transformation of plumage and form is nothing in comparison to the vast improvement in egg production. The wild jungle fowl lays from six to ten eggs a year, while there are domestic fowls today which lay from 265 to 300 eggs a year. All of this has been brought about by careful selection, breeding and feeding.

There is a big variation today in the productiveness of our hens, and the 200 eggs a year hen is still in the minority, in fact the vast majority of hens lay far below this figure, and some of our neglected farm flocks average less than a hundred per hen.

The utility side of the hen is still open to much improvement, notwithstanding the rapid strides we have made along this line.

The census reports show that the American hen only averages 85 eggs per year, but as this report takes in many hens which are too old to lay, or else receive such poor treatment and feed that they cannot do much for the egg basket, it is hardly fair to take this figure as the basis of the average egg production of our domestic fowls. There are many flocks of good hens that go far above the 150 mark, and some that average 180 and 200 in one year. Of course these are well bred and selected stock, which receive the proper feed and every other attention to make them prolific.

It is often asked whether it is possible to produce a flock of hens that will average 200 eggs per year. I say, yes. Do not expect to accomplish this in a year's breeding, that would be impossible. To accomplish this end, great care must be exercised in the selection of the breeding stock to start with, and then most diligent culling thereafter. Not alone must you have the proper foundation stock to work on, but you must also do the right kind of feeding with foods of the correct balanced rations. Then again you must have cheerful and healthful surroundings in the houses and runs, plenty of exercise, sunshine and shelter, good systematic care and every attention must be paid to their welfare.

So many farm flocks make such poor showings in egg production on account of neglect, they are forced to forage for themselves, or else are fed on nothing but corn. They are housed in buildings that are cold and damp in winter, and overrun with vermin in summer. No attention is paid to the age of the hens, and many stay on the farm until they die from old age.

If the farmer who complains of poor success with his hens would pay more attention to their wants, give them the properly balanced rations, good housing, cull out the drones, and keep the flock busy in winter as well as in summer, there would be a different story to tell. There is no reason why poultry should not be the big payers on the farm.

CHAPTER XXI

WINTER EGG PRODUCTION

IT is a well known fact that hens which receive the least care and attention will lay most of their eggs in spring time, when conditions are most favorable for egg production. It therefore behooves the poultry keeper to study those conditions and endeavor to supply the hens with the same conditions during the colder and less favorable weather.

During the warmer period of the year the fowls get abundance of green food, many insects, plenty of fresh air and exercise. By supplying the hens with these same necessities for egg production during the colder months we may obtain to a great degree the same favorable conditions as for the springtime egg yield.

In order to sustain the vital forces in laying hens during the cold weather, the daily rations must be increased and more heat forming food must be supplied, so that the fowls may be comfortable at night. By giving the flock warm mashes or warm water it is not necessary to feed quite so heavily, lessening, as a matter of fact, the keep cost during the winter months.

For winter feeding scatter a variety of whole grain on the litter each morning. This will produce

the necessary exercise and keep the hens in good laying condition. At noon give them a warm mash of ground grain, mixed with either skim milk or water, not sloppy but mixed to a crumbly mass. Feed just enough to be consumed quickly so that there will be none left over to get cold and sour. Table scraps added to this mash will be found beneficial and will be much relished by the fowls. Late in the day the birds should have a supper composed of corn, oats, and wheat or barley. A handful to each fowl is about the correct amount, but it should vary somewhat with the breed and weather conditions.

The vegetable diet should not be overlooked, as that is one of the principal items on the laying hen's regular bill of fare, if the proper results are to be attained. There are many kinds of vegetable foods which can be used for this purpose, among them clover, alfalfa, mangel roots, turnips, cabbages, etc. A good way to feed cabbage is to hang a head on a string and let the hens jump for it. This supplies them with additional exercise.

Quality of feed should also receive every consideration. Do not feed any musty, moldy, or damaged grain of any kind. Although such grains can be purchased cheaper it is by far better to pay a little more and get a good, healthful food. Experiments have shown that the food consumed by a hen imparts its flavor to the egg, just the same as the food given the cow produces the flavor to the milk. Feed your

hens large quantities of onions and I venture to say you will find the eggs laid by your hens unfit to eat.

The color of the yolk of an egg is also affected by the feeding. A bulletin issued by the Utah Experimenting Station says: "It has been observed by poultry keepers that the yolk of eggs laid by the hens in winter is frequently very pale. This has also been noted in the eggs laid by hens in our experiments. The color approaches that of a lemon, while the normal color is more that of a ripe orange. Such eggs are not classed as select, which of course affects their saleable value.

"To determine whether the color of yolk is affected by the food, several tests were made during the past winter at the station. On February 9th pen of six White Plymouth Rocks had lucern (alfalfa) leaves added to their ration. The leaves were fed dry, being thrown on the floor of the pen daily. None of the other twenty-five pens were given any. The green food consisted of sugar beets. Pen 6 had sugar beets also.

"On February 27th an examination was made of the eggs laid by this pen, and it was found that the yolks were uniformly normal in color, while the eggs from the other pens continued to have yolks uniformly pale in color. The pens were not all fed the same ration, but the only ration that produced eggs of normal color was the one with lucern leaves.

"Pen No. 5 as well as pen No. 6 was fed a corn

ration; that is, their principal grain was corn; the other pens had more wheat than corn. The corn was a mixture of white and yellow, the white kernels predominating, it being impossible to get any other kind in this locality. This corn did not seem to affect the color of the yolk, as eggs from pen No. 5 were of the same color as the other pens on the wheat ration. Pen No. 14 was fed skimmed milk in place of meat scraps and cut bones which the other pens received. The eggs from this pen were of the prevailing pale color.

"On March 1st the feeding of lucern leaves to the following pens began:—Nos. 2, 5, 7, 8, 25, and 28. On March 9th pens 9 and 11 were added to the lucern pens, and on March 14th pens Nos. 14, 15, 18, 20, and 22 were added. On March 18th, eighteen days after the feeding of lucern began, pen 5 on the corn ration, and pens 7, 8, 25, and 28 on the wheat ration, were producing eggs with yolks of normal color. Pens 3, 10, and 27 without lucern leaves continued to lay eggs of the original pale color.

"On April 5th the eggs from pens 3, 10 and 27 were still pale in color. On this date the hens were turned out into the yards which had a growth of green grass, lucern and clover, and on April 16th they were laying eggs with yolks of good color."

It will be noted by the foregoing that alfalfa (lucern leaves) fed in winter has the same effect on eggs as grass has during the spring and summer

months. Alfalfa has proven itself a very valuable food for dairy cows, and it is becoming just as popular with poultry raisers as a winter food for hens.

Alfalfa when properly cured possesses 14 per cent of crude protein while red clover possesses 12 per cent and mangel roots only 1½ per cent of crude protein. The third and fourth crops of alfalfa are most suited for poultry food.

Usually the pullets are the best winter layers; it is therefore advisable to keep as many pullets as possible, if winter eggs are desired in large numbers. Pullets that start laying in November, if given the proper care, housing, and feeding will keep up the pace all through the cold weather.

CHAPTER XXII

OVERCROWDING

OVERSTOCKING is one of the common mistakes of the amateur poultry raiser. His enthusiasm has run high and his zeal is apt to get the best of him. Capacity must be reckoned with; it means much in the way of proper results, and figures extensively in the profits to be derived from the enterprise.

It is just as unreasonable to expect to operate a large poultry plant in a small back yard as it is to operate a big manufacturing plant in a small building. In either case the business would be unprofitable to say the least, and would soon be given up as a failure.

Many losses among both chicks and grown-up fowls can be attributed to overcrowding. Our domestic fowl can stand considerable confinement, providing, of course, it receives the proper food and attention, but it cannot withstand the hardship of being kept in large numbers in a small space. Too many fowls in a small space will breed disease, resulting in a rundown flock and many deaths.

Hens when overcrowded will not produce the proper amount of eggs, and those eggs which are laid will not bring forth the healthy and vigorous chicks. Overcrowding often causes feather eating,

one of the worst habits affecting a flock of fowls. It is also one of the causes for roup, diarrhea, and cholera, and when one of these diseases makes its appearance conditions are favorable for a rapid spreading of the disease, transmitting it to every specimen in the flock.

The danger of falling a victim to this mistake does not lie in the first year's operation of the poultry plant, but the second and third year usually open the temptations to the inexperienced to exceed the capacity limit. By that time his ambitions have grown, his little flock has done well, poultry keeping in the small way has proven profitable. Why not make four times the profit he is now making? The decision is made to keep just four times as many fowls on the same size lot, and in many cases the same sized houses. The inevitable results are contaminated runs and stuffy, foul aired houses, breeding the germs of disease and weakening the strain of birds. Thus instead of increasing the profits they are completely wiped out, leaving a deficit on the account books.

In many cases overstocking the capacity of the plant is caused by the inability of the amateur to properly cull his flock, or possibly lack of judgment in disposing of the surplus in the season when the demand is the best. The one who has paid fancy prices for his starting stock or eggs for hatching naturally expects, and has a perfect right to expect,

better than the ordinary market prices for the surplus birds and eggs.

One of the hardest problems for the inexperienced to solve is how to sell the surplus fancy stock at the best advantage. It is unreasonable to expect the buyers to know about his surplus unless he tells them about it. Every poultry raiser who expects to sell fancy poultry at good prices must of necessity spend some money for advertising. How is any one to know that he has anything to sell unless he announces the fact?

First of all, the breeder must know when to advertise; second, how much to spend for advertising; third, where to advertise, and last but not least, how to close the sale when the inquiry is made. Salesmanship cuts some figure in the successful disposing of surplus birds or fancy eggs. The most successful poultry sellers are those who know how to follow up an inquiry.

The amateur must also keep in mind the fact that every bird he raises cannot be sold at a fancy price. Although the original stock has come from the best strain and has been mated for the best results as to standard requirements, etc., there will still be specimens unworthy of demanding the better prices.

Like does not always beget like in fancy stock raising; the best often produce only birds of ordinary quality, lacking in many points necessary to make them good birds to breed from. The breeder who

wishes to build up the most honorable reputation will do well to use the hatchet quite freely when culling time comes. Do not expect others to use fowls for breeding which you would not care to use in your own yards.

The careful breeder will cull his flock closely, for upon it depends the successful building up of both a strain and a reputation. Amateurs should keep this advice foremost in their minds at all times. It is the big secret of building up a successful future in the poultry business.

CHAPTER XXIII

ADVANTAGES OF SMALL FLOCKS

THERE are several advantages in keeping a small flock. It is a more concentrated effort on the part of the operator of a small poultry plant, which in most cases means better care and attention. Of course this is not always the result, and should not be construed as an incentive not to breed poultry on an extensive scale. Some of the large poultry farms of today are conducted very successfully, and are showing handsome profits on their investments, but the percentage is smaller.

On a small poultry plant the operator, as a rule, does all of the work personally, it is an individual effort on his part without any assistance whatsoever. He becomes better acquainted with each individual fowl upon the place; he soon discovers their shortcomings, and keeps in close touch with their development and health. If he is interested as he should be, seldom will a sick bird escape his notice, nor will he fail to notice a brood of chicks which do not show the proper growth.

The one who keeps poultry in a small way can make conditions more ideal for the hens, he can supply to the fowls more beneficial articles of food, such as table scraps, which could not so easily be

supplied to the fowls of a more extensive plant. Even though he be an amateur he will soon learn the wants of the hens, and what is best for the flock kept under the particular conditions of his plant. Different conditions require different feeding and care, and it is not always best to follow a set rule or method along this line.

The greatest contention of the extensive poultry raiser is help. Good, reliable help for a poultry farm is difficult to obtain. Inexperienced help must be closely watched, and experienced help often have ideas of their own not in harmony with the operator. The one who must depend largely upon his help to look after his hens is liable to be disappointed in the management of his flock, unless he knows with certainty that such employees have the ability to conduct the plant successfully. The trouble with many of the poultry farms seems to be the employment of cheap help, they fail to realize the importance of having men look after their stock who are sufficiently versed in poultry keeping to get the best results possible from the stock and equipment at hand. Many dollars are lost by such a false economy policy.

The intensive poultry raiser can look after every detail himself. He sets his own hens, operates his incubators and brooders, feeds his stock, gathers the eggs, culls the cripples and weaklings, and personally keeps the houses clean and sanitary. His

money is invested in the enterprise, and he realizes that upon his personal efforts depends the success of such an undertaking.

Even some of the larger poultry farms divide their pens in small flocks, claiming that they get better results from this method, and reduce the dangers of an epidemic of a contagious disease to a minimum. Breeders of poultry for show purposes invariably adopt this method, as it makes it possible to mate the various breeding pens for certain points which could not be obtained as easily in any other manner.

CHAPTER XXIV

INTENSIVE AND EXTENSIVE POULTRY FARMING

PROF. JAMES DRYDEN of the department of poultry husbandry, Oregon Agricultural College and Experiment Station, has this to say on extensive and intensive poultry culture:

"It is possible for a family to make a living on a city lot from a dozen hens if the family tastes are not extravagant, and, again, if big enough prices are secured for the eggs laid by the hens. We must consider the prices. There should be breeding farms in all sections of the country if our stock of fowls is to be improved, and there should be in every community or country men and women who give their special attention to the production of improved strains of fowls, whether the point to aim at is eggs or show points.

"There are many different systems of poultry farming, and in speaking of profits the distinction should be kept in mind. There are possibilities of profit in farms in which profits are added to by selling at least part of the product for breeding purposes at high prices. If a man makes a living on a city lot it does not mean that he made it by selling his eggs and poultry at ordinary market prices.

"Whatever may be the dividing line between extensive and intensive poultry farming, or whatever the point one merges into the other, it will be readily assented to that a poultry farm of 100 acres, occupied by from 1,000 to 5,000 hens, is extensive poultry farming. On the other hand, it will also be understood that a farm of four acres, on which 1,000 or 3,000 hens are kept, is intensive poultry farming, and it must be conducted under intensive methods.

"At what point by extending the acreage without increasing the flock, or increasing the flock without extending the acreage, a farm becomes more extensive on the one hand or intensive on the other, may be open to debate. Poultry keeping must necessarily be intensive on two or three acres, where the owner depends upon the products of the poultry yards for a living for himself and family. Any poultry farm up to ten acres, where enough fowls are kept to keep a family, will require more or less intensive methods.

"Probably the best way to define an extensive poultry farm would be on the basis of so many fowls per acre, or on an acreage basis. Fifty fowls per acre or less would certainly come under the extensive system, and it may be that the limit could be increased to 100 per acre. When, however, we reach 100 per acre we are getting to a point where the poultryman must resort to artificial methods,

more or less, in keeping the yards or land in proper condition for maintaining the health and vigor of the fowls. This raises another point. Soil varies and the climate varies to such an extent that fifty might be a safe limit in one case and 100 in another. More than fifty fowls an acre on certain soil and in certain climates might require intensive methods, while 200 per acre on other soil and under other climatic conditions might not require any very intensive culture.

"The nature of the soil and the climate must be considered. An open, porous, well drained soil is more favorable for intensive poultry culture than a heavy clay soil. That is, 100 fowls might be kept on an open porous soil with less danger from soil contamination than fifty on a heavy clay soil. So it cannot be stated definitely that a certain number of fowls per acre within certain limits means either extensive or intensive culture. This fact should be borne in mind in reading the account I shall give of some intensive poultry farms.

"On one farm the total egg yield for 1909 was 86,519. The yield for the following year up to Oct. 1 was 90,870. The total receipts for the first year were $6,493.41; the last year until Oct. 1, $5,235.48. The statement showed that the receipts for eggs and poultry and the receipts for breeding stock and eggs for hatching were about equal. The flock was bred along utility lines, but

the farmer had some show birds and they brought a good price. The highest price he received for market eggs was 55 cents and the lowest 18 cents per dozen. The best month in egg yield during the first year was March; the poorest November. The second year the April yield slightly exceeded that for March. While this agrees with conditions in the cold eastern states, I should expect, were the figures obtainable, that there would be a higher percentage production here in the winter months than in the cold states, due to a more favorable winter climate. The eggs were sold to retail dealers, though quite a number were sold for incubation purposes at $6 per hundred. He has secured as high as $25 for a breeding cockerel, though he makes no specialty of breeding fancy stock.

"The system of feeding includes a dry mash feed in the morning. The formula is as follows: Bran, 640 pounds; ground barley, 200 pounds; feed meal, 300 pounds; shorts, 360 pounds; blood meal, 100 pounds; fine bone, 50 pounds; alfalfa meal, 100 pounds; beef scrap, 200 pounds; oil cake meal, 100 pounds; charcoal, 20 pounds.

"In the evening wheat, barley, cracked corn, etc., are fed. For green food, kale, swiss chard, lawn clippings, etc., are fed. Sometimes grain is sown in the runs and plowed under. When the grain sprouts the chickens scratch it up, thus getting green feed and exercise. This farmer has thor-

oughly learned the importance of cultivating and growing crops in the yards to keep them in a sanitary condition, and his yards all showed that they had intelligent care.

"One of the most interesting of intensive poultry farms that I have seen is situated near the Old San Gabriel mission, not far from Los Angeles. Here is another 'ranch' of four acres where 2,500 layers are kept, and the same ground has been used continuously for five years or more. We are accustomed to saying that it is impossible to keep chickens successful year after year on the same ground, but here is an apparent contradiction. Up to date no serious calamity seems to have befallen the fowls on account of soil contamination.

"It is, of course, another question whether the farm can be continued for another five years without showing symptoms of collapse; but a few explanations are needed here. A little discrimination is required. The poultry man must be able to discriminate so as to suit his system of poultry keeping to his conditions. What suits one man in one location won't suit one man in another, and the only thing that will save the poultry man is his own head. He must be able to decide for himself, after all, what is the best for him in his particular locality.

"When I say that here for from five to six years fowls have been kept successfully in large numbers on a small piece of ground, I know a great many

will be inclined to question the statement. Others, with less reason, will go and do likewise. Now the only thing that has saved this ranch from collapse has been the soil. The soil is very light and somewhat gravelly and the rains do about as good a job on it as a vacuum cleaner does on a carpet. This with the bright sunshine has enabled the owners to do something that could be done in probably few places in the country."

CHAPTER XXV

PROPER VENTILATION

THE most important feature in a poultry house is proper ventilation. An efficient system of ventilation affords an abundance of fresh air without drafts. Fresh air keeps the house pure and dry. Nothing will cause disease more readily than a damp house or one which has a foul odor.

There are several ways to supply ventilation, but the simplest and least expensive is to have an open or muslin covered front. These open fronts on the houses should be protected in some way to prevent the rains and snows from being blown into the interior. It is a good plan to attach an awning made of wood or some other light material, arranged in such a manner that it can be lowered or raised.

Muslin will keep out the snow and rain to a certain extent, but when it gets wet the cloth loses some of its merit as a ventilator, as damp muslin will not permit a free passage of air. By protecting the muslin with an awning it will not be affected in that way. The muslin should be put on a frame so that it can be removed on a pleasant day, allowing fresh air to circulate through the house on such days.

If the ceiling or walls of the henhouse are damp it

is not properly ventilated. Any odor is sufficient evidence that the house is not properly aired.

Drafts are just as injurious to the health of the flock as improper ventilation is and must be carefully guarded against. Drafts can be avoided by having all openings on the end of the house, preferably the south end. Have the north and west ends or sides built as tightly as possible and well protected from the winds.

A glass front house causes extremes in temperature, warming up in the day time and then turning cold with the setting of the sun. This is also apt to cause disease and make the fowls' combs and wattles more sensitive to frosts. The open muslin front is by far the best and at the same time the least expensive. Some glass may be used, but not exclusively.

Poultry to be healthy must have plenty of fresh air. They must breathe this fresh air all the time, at night as well as during the day. The carbon dioxide gases are expelled by the fowls in the process of breathing, and these should not again be inhaled, but pure fresh oxygen should go into their lungs, if we expect our poultry to be healthy and vigorous. Many of the flocks which have a tendency to be delicate, are kept in houses not supplied with the proper amount of fresh air.

In supplying the hens with this necessary fresh air there is no necessity to expose them to draughts.

The old method of building poultry houses was to make them as air-tight as possible, and then to obtain what was then called ventilation, various forms of ventilators, some from the floor and others from the top, were constructed, believing as we did in those days that such contrivances would do the work properly. These houses were also heated, thus making the fowls as delicate as hot-house plants. The up-to-date poultry man now has discarded these old ideas, and no matter whether he keeps poultry in Maine or Louisiana he uses the open front poultry houses, and finds that his poultry keeps much healthier, and does better than when the air-tight houses were used.

Fresh air poultry keeping has developed within the last few years and it has experienced every weather condition in all parts of this country, and in no case has it proven anything but a big success. It has diminished disease amongst poultry, and has made the flocks more vigorous, thus helping to make them more productive. Its introduction has solved a perplexing question for the poultry raiser, it is a boon to the industry and a great benefit to our feathered tribe that is just beginning to be felt.

An open front house can be cheaply constructed and still answer the purpose for which it is intended. It is not how much you put into a house, but how you build it, construction is all, and means much for the health of your flock. Ornamentations add

to the appearance, but plans made according to hygienic principles make for the comforts of the inmates, and after all, that should be the first thought in poultry house construction.

In climates where the weather does not get too severe houses of this construction need no other arrangements for the comforts of the birds, but in localities where the thermometer gets down near or below the zero mark, curtain front perches should also be provided. These drop curtains in front of the perches will provide ample protection to the fowls in the coldest of weather, and not prevent them from being supplied with fresh air during the roosting hours. These curtains may be made of burlap or muslin, hung from the top, covering the entire roosting space from the top down. If the roosts are shorter than the building, side curtains must also be provided for the ends of the perches. Either have these curtains put on frames or hung loose with a weight on the bottom to keep them in position. In other words this roosting place should be a box-like room, without any openings whatever on the ends and back.

I would advise that these roost curtains be cleaned and disinfected at certain intervals so that they will always be in a sanitary condition. A good idea is to change them each fall, the material is cheap.

Houses constructed on this principle are free from dampness, prevent roup, are perfectly ventilated and

free from bad odors both day and night. Every beginner should by all means construct or purchase open front poultry houses, if he or she wants a vigorous and healthy flock of fowls. It is the last word in poultry construction, and is used at all the state, government, and other experiment stations, also by the progressive fancy and market poultry beeders of today.

In a cold climate it is advisable to keep the fowls hardened to the cold. Turn the hens out in the runs on sunny days even if the weather is a bit cold. When the air is still and there is no snow on the ground even the large combed varieties, such as Leghorns and Minorcas may be safely turned out in the pens. Hens can stands lots of severe weather if they are not brought up like hot house plants. They are well protected with feathers, and if provided with the proper feed and exercise will keep very comfortable in the coldest of weather. In fact hens do better when out in the air away from their roosting quarters.

If fowls are started out right in the fall, they will go through the severest of winter weather without much trouble. Do not house your stock closely in the fall and expect it to do well when the cold winter days are here. Get them accustomed with the weather conditions and they harden with the seasons.

Many a good show bird has gone to pieces by

being housed too closely. Amateurs, as a rule, when they buy a fine specimen at a good price, are so afraid something will happen to their valuable purchase that they are afraid to expose the bird to even the least fresh air, and as a consequence the once valuable show specimen deteriorates. Plenty of fresh air will not hurt animal life, in fact, it is absolutely necessary, and what is true of other animals is also true of poultry—fresh air, and plenty of it, is the rule.

CHAPTER XXVI

WHY HENS DON'T LAY

"WHY don't my hens lay?" This by itself is a hard question to answer, in fact, it is unanswerable unless the seeker of information goes into details as to the general care, housing, and condition of the flock. Even when all these details are given the desired advice is not easily supplied.

For instance, one beginner writes as follows:

"My hens are yearlings of the White Leghorn variety. They are fed on the best scratching food obtainable, deep litter feeding, with a well balanced mash at noon. A hopper placed before them contains a supply of grit, oyster shells, charcoal, and dry beef scraps. Every day they get green food, and plenty of fresh water, also raw meat twice a week. And still no eggs."

This is only one of the many. Surely he is not far wrong on his feeding, provided, of course, he does not overfeed. Presuming that he does give them about the right amount, what is the trouble with his flock? It might be the housing or perhaps the condition of the house.

There are other things besides wrong feeding and old age which will produce a non-laying flock. There are things which are just as important to the hen's

welfare as the different foods and the water. Just as important, and more so, than the variety of fowls kept, and just as important as the grits, charcoal, etc. Notwithstanding the fact that the hens are getting the foods necessary to make eggs and plenty of exercise in deep litter to prevent laziness, it may still be possible for the hens to be in such a condition that the production of eggs is impossible.

The question then is what has put the hens in such a condition.

Poorly constructed or damp houses may be the cause for such nonlaying condition of the hens, improper ventilation or overcrowding of the laying houses, or perhaps unclean, insanitary surroundings. At certain seasons of the year vermin may also cause such a condition of the laying stock, or in the fall and early winter months molting of feathers will cause the hens to stop laying.

The changing of the birds from one quarter to the other will stop the hens laying for a short time. Beginners buying a flock of hens or pullets and moving them into their new home should not expect them to do their duty until they are accustomed to their surroundings, which ofttimes takes about three weeks.

In the majority of cases it is not the hens' fault for not laying, it is the keeper's.

CHAPTER XXVII

BREAKING UP A BROODY HEN

BROODY HENS about the premises when not needed are a source of loss and their brooding should be broken up as soon as possible. Some claim that hens show signs of broodiness when they need a rest, but this is not always the case. If this were true some hens would need a rest most of the spring and summer.

There are hens which lay only a few eggs and then become broody. This certainly is not caused by natural conditions. Some breeds are naturally more broody than others, and then again we have hens which get the setting fever from being too fat.

There are various methods for breaking up a broody hen, some of which are exceedingly cruel. One of these cruel methods is to dip the hen in cold water. A hen when she is in a broody condition naturally has a high temperature, and to treat her to a cold water cure at that time produces a severe shock to the system which may terminate disastrously. There are more humane methods which serve the purpose just as well. Another method which should be condemned is putting the hen in a tight box for several days without food or water. When the hen is released from this solitary

confinement she is in most cases more dead than alive, and of course such treatment will affect her vitality.

Here is a simple and civilized method for breaking up a broody hen: When a hen becomes broody let her sit for a few days in order to give her system time to recuperate and at the same time making it easier to get her out of the habit when she is once taken in hand for treatment. After she has had her few days' stay on the nest put her in an airy and roomy coop, the bottom of which is made of strips, with plenty of air space so as to permit ample circulation. Suspend this coop in the air, thus permitting plenty of air from the bottom. Feed lightly, but supply with fresh water. The hen knows only too well that she must have warmth from below in order to hatch anything, and she will soon realize that her case is hopeless and give it up as a bad job.

CHAPTER XXVIII

A GENERAL OVERHAULING

At the end of the breeding season, and immediately after the breeding pens have been broken up a general house cleaning should take place. Even though the houses have had their weekly cleanup, a complete renovation is advisable. Everything should be thoroughly overhauled. It may seem a big task but when completed the general appearance and freshness about the place will repay you for all the labor.

Much labor can be saved by forethought in the construction of buildings and fixtures. The interior fixtures of an up to date poultry house should be removable, easily taken out, and easily put into place again. The roosts, nest boxes, dropping boards, etc., should be so constructed that they can be taken out of the house, where they can be carefully overhauled, disinfected, and whitewashed. All the nesting material should be burned and clean, fresh straw put into each nesting box. Sweep off the walls and ceilings of the houses and put on a new coat of good whitewash. Before putting on the whitewash it is advisable to disinfect the house. A spray pump will do this work thoroughly and make

it possible to reach every crack and crevice about the place.

If the floors are of dirt, take four or five inches off the top and put in new soil. Should this not be done there will in time come a foul odor from such neglected floors which will endanger the health of your flock. Always have the dirt floors several inches higher than the ground surrounding the building, thus preventing the rains from coming in. One of the main things in a poultry house should be dryness. Dampness will raise havoc with the most vigorous stock, and more diseases are attributed to it than any other cause.

Boil all the drinking vessels and thoroughly clean all feeding hoppers, grit boxes, etc. Do not keep any leaky drinking founts, no matter how little they leak. They are a cause of dampness. Never use any vessels that cannot be cleaned.

During the house cleaning one should also make a careful inspection of the roofs to see that none of these are weather worn. A good tight roof means much to the comfort of the inmates.

If there is any glass in the house, give it a good washing; tighten up all loose panes; and a coat of good paint on the sash will help to preserve it. Many window sashes go to pieces for want of paint. A few pennies spent at the right time for paint may save you dollars in the end.

All wooden floors and dropping boards should be

scrubbed with a strong disinfectant solution. A coating of lice paint on the roosts is also advisable.

After the houses have been thoroughly cleaned and disinfected, put some clean, fresh litter on the floors. Then let the hens back into their homes, sprinkle some scratch feed into the litter, and watch the flock enjoy their clean quarters. They will soon show their appreciation of bright surroundings by increasing the egg yield.

The next to tackle are the pens or runs, and the smaller they are the more thoroughly they should be cleaned, raked, and scraped. A good spading will make them fresh and sanitary. Also inspect the fencing, which perhaps needs repairing.

All the brooders and brood coops not in use should be gathered up and put under shelter. A little forethought in that direction will save much wear and tear on these appliances. Before storing these away, give them a good cleaning and disinfecting, so that they will be in a sanitary condition when they are brought out again for another season's usage.

A poultry raiser who has the proper interest in his business takes delight in having everything about the plant clean and sanitary. Those are the ones who will, nine times out of ten, make a success of the business. No one need expect good results when the comfort of the fowls is neglected. Neglect and carelessness are bound to spell failure to any

poultry raiser, no matter how carefully he or she has selected the stock or how much was invested in the buildings and appliances. One cannot expect to run a poultry plant, be it ever so small, without doing some work. Proper conditions must exist in poultry yards to get the proper results. Hens will not lay if they receive poor treatment—that is a settled fact.

CHAPTER XXIX

INFERIOR FOOD

THE health of a flock of fowls is often jeopardized by the quality and quantity of food. Damaged foods, such as moldy grains, old musty beef scraps, decayed vegetable matter, tainted meat, or green cut bones, and improperly cured alfalfa, are the common causes of a large percentage of the diseases affecting poultry.

Too much care cannot be exercised in purchasing the various grain foods, and the saving of a few cents on the bushel should offer no inducement to the poultry raiser to buy the cheaper grades. It pays to buy the best, and even then a careful inspection should be made to ascertain that the quality is what it should be and what it has been represented to be. Very often feed dealers, aware of the fact that the grains are to be fed to chickens, will not be particular about sending the best, even though the price was paid, thinking, no doubt, that anything is good enough for chickens. The best plan is to visit the dealer, examine the feed personally, secure a sample, and upon delivery make sure that the grain received is up to the standard of the sample.

Grain which has been water soaked and then permitted to dry is unfit for poultry food; and in most

cases it can easily be detected by the musty odor. Such grains are often sold by feed dealers as poultry feed, some of which is nothing more or less than the salvage of some elevator fire. Grain thus damaged cannot be sold for milling purposes, and is therefore palmed off on the poor, helpless hen, which is supposed not to have much of a taste, and is able to subsist and do very well on almost any thing. That, at least, is the theory of many of the grain dealers, and in many cases the everyday man who has not had any experience in poultry raising.

Poultry, both fowls and chicks, must have a variety of wholesome, palatable and nourishing food, and unless the food given contains these qualifications, the birds will not do well—the hens will not lay, the chicks will not grow and the hospital is very apt to become crowded.

During the summer months be careful about feeding sprouted oats, for oats sprouted in boxes during hot weather are very apt to be moldy, in which condition it is dangerous, causing indigestion, sour crop, diarrhœa, or other bowel troubles.

Special attention should be given to the animal matter fed to the fowls. Ground meat or green cut bone should not be permitted to stand around in warm weather, both of these should be ground and fed fresh each day. If this cannot be done, I would advise feeding the dry beef scraps sold by

poultry dealers, but even these must be of a high grade and properly prepared. Always place the beef scrap hoppers in a shady place, as the scraps are very liable to be affected by exposure to the hot summer sun.

Do not feed the stock too heavy; overfeeding causes the majority of cases of indigestion, bowel trouble, diseases of the liver, and other ailments of the intestines and crop. Poultry to be fattened for the market can be fed heavily, but don't stuff the layers or the growing chicks. There is no positive rule on how much to feed each hen, or each chick at its various size and age, and this knowledge can only be gained by experience. Some birds require more feed than others, and the only safe rule is to feed them all that they will eat up clean at each feeding. If fed too much the fowls will pick out certain grains which they like the best and leave the others, and in that way possibly be without the very grains which are the best for them, and which help to make a well balanced ration, mixed to produce certain results. Overfed hens will become inactive and unprofitable.

CHAPTER XXX

SUPPLYING GREEN FOODS

A PROBLEM that confronts, or should confront, every poultry raiser is how to supply the flock with green food all the year around. The amateur will ask: "How am I going to supply my birds with green food in the dead of winter?" The answer is that there is not a raiser of poultry, no matter where located, who cannot produce green food during every season in the year.

In summer green food can be supplied with scarcely any exertion. If there is room enough to raise poultry there is also room enough to raise greens. The succulent juices of green foods promote digestion, and good digestion means healthy fowls, while healthy fowls mean productive and profitable fowls. Hens must have these succulent juices in sufficient quantities in order to produce a creditable number of eggs. Green food is as much a necessity to fowls as oil is to machinery. You can damage your flock of poultry as much by the omission of green food as you can damage machinery by not supplying the proper amount of oil.

During the spring, lawn clippings, especially those that contain clover, are very good, and are easily

obtained. The backyarder may also plant a small bed of lettuce and replant as the season advances.

In summer oats may be planted in place of the lettuce. Oats grow very rapidly and the green blades are excellent food. Rye is advisable for fall, as it will keep green all winter. Rape sown not quite so thick as oats or rye is very hardy, grows rapidly, gives an abundance of succulent juices, and is relished by the fowls. Summer is a good time to plant this seed and it will supply green food for the flock until late in the fall.

Apples and tomatoes, those not fit for the market, are also excellent feed; in fact, any fruit is relished by the fowls. Onions and onion tops stimulate the action of the liver and are healthy foods, but if fed to excess have a tendency to affect the flavor of the meat as well as the flavor of the eggs. Growing chicks may be fed onions in any quantity and it will do them considerable good.

Cabbage is an old standby as a winter poultry green food. It is easily grown and can be put away for winter use. The large, solid heads may be used for the table and the culls kept for the fowls. Always keep the cabbage patch well cultivated and free from weeds. Store the cabbage in a cellar or put it into a hole, covering the top with boards, then cover the tops of the boards with earth, leaving an opening at one end from which to extract the heads as needed. As soon as the ground freezes the cab-

bage will also freeze and remain frozen all winter, thus supplying an excellent green food all winter. The best method for feeding cabbage is to hang it on a nail just within easy reach of the fowls. Always thaw it before feeding.

There are several root vegetables which make good green food for winter use, chief among which are mangels. They will thrive in any climate and require little ground. They should be sown early in the season. Harvest them before frost and store in the cellar.

Turnips and rutabagas are also popular winter poultry foods. They should be sown the early part of August and if put on clean ground require very little attention. Raw potatoes are also quite extensively used and are preferable to cooked potatoes, which have a tendency to fatten the laying hens. This is especially true of the heavier breeds. Some feed whole potatoes, while others chop them up fine and put them into the mashes. Small cull potatoes, not good for table use, may be purchased very reasonably in the fall.

Alfalfa and green cut clover, when properly cured, are very good as winter green foods. These may be purchased at poultry supply stores in almost any quantity. In alfalfa there are three grades—meal, shredded, and short cut.

The meal and shredded are used in the mashes;

many of the commercial ground and mixed mashes contain a proper percentage of these.

Cut and well cured clover is also used as a winter green food, but not as extensively as formerly. Alfalfa is better.

Sprouted oats is also used as a fall and winter green food diet. Some breeders who feed nothing else have excellent success.

With the many excellent green foods mentioned there should be no difficulty in selecting some which you can raise or buy and thus give your fowls something which nature requires they should have.

CHAPTER XXXI

GENERAL FEEDING

It is a well known fact that up to the last few years most farmers fed their flocks on an exclusive corn diet, but since many of the farmers have added wheat and oats to the daily ration there has been noted a substantial improvement in the egg yield of farm flocks. This fact is borne out by government reports on the subject.

Fowls properly housed should be fed in the ratio of one part protein or muscle producing compound to four parts of carbohydrates or heat and fat producing compounds.

A mixed ration is preferable, but where one single grain is to be fed oats without a doubt comes nearest being the ideal food. Wheat is much preferable to corn. In feeding oats it is best to feed that from which the hull has been removed. A little buckwheat is all right, but if fed too heavily it will produce a light colored yolk in the eggs.

Fowls do much better on a mixed ration, and although this mixed ration may contain the same nutritive ratio, nevertheless the results obtained are better. They seem to relish their meals more when a variety of grains is fed, and a larger percentage of the whole ration is digested.

Regularity in feeding is of great importance in order to get the proper results from the flock. Feed the hens their various meals at certain times, and do not let the time vary very much from one day to the other. The old saying, "There is a time for everything," should be strictly heeded in the poultry business. It is just as important when you feed as it is how you feed and what you feed.

It is also essential to feed the breeders correctly during the hatching season to obtain fertile, hatchable eggs with strong germs. They should be fed foods which will strengthen their constitutions but not too fattening. Hard grains, dry mashes, plenty of green food, and animal matter, together with grit, oyster shells, and charcoal, produce the best results.

Powdered charcoal should not be fed in the mash, it is not a feed, but a medicine. It purifies the blood and absorbs noxious gases generated in digestion. By feeding it in the mash the fowls eat more of it than what they require. Use the coarser grades of charcoal and feed it from a hopper or other feeding utensil, thus permitting the fowls to partake of it when necessary.

In feeding dry beef scraps use only the very best quality obtainable. Some of the so-called scraps sold are nothing more than fertilizers, and are entirely unfit for poultry food. A good article can

be detected by scalding, it should have the odor of cooked meat.

Milk in almost any form is an excellent food. It may be given as a drink or used in the mash in place of water. Skim milk and buttermilk are in most common use.

Stale bread may be used with perfect freedom, it containing nearly the nutrient ratio of wheat. It may be used in the mash or otherwise.

The laying hens should have a supply of crushed or ground oyster shells before them at all times. They furnish the material for egg shells.

CHAPTER XXXII

MARKETING AND GRADING EGGS

PROPER marketing and grading of eggs is a subject which does not receive the careful attention its importance deserves. It is neglected mostly by the smaller egg producer, who perhaps is not posted on market conditions, or knows very little about the losses which are bound to result from lack of attention to grading.

The bureau of animal industry, United States department of agriculture, has issued a very interesting bulletin on the grading of eggs for market purposes, from which I quote the various grades as follows:

"Fresh Eggs—An egg to be accepted as a first class, or fresh egg, must be newly laid, clean, of normal size, showing a very small air cell, and must have a strong, smooth shell, of even color, and free from cracks. With the exception of the air cell, which is only visible through the aid of the candle, these are the points by which eggs are graded in the early spring, at which time they are quite uniform in quality, thereby making candling unnecessary.

"Checks—This term applies to eggs which are cracked but not leaking.

"Leakers—As indicated by the name, this term

applies to eggs which have lost a part of their contents.

"Seconds—The term 'seconds' applies to eggs which have deteriorated to a sufficient extent as to be rejected as firsts. They are, however, of a high enough quality to be used for human consumption. The several classes of eggs which go to make up this grade may be defined as follows:

"(a) Heated egg: One in which the embryo has proceeded to a point corresponding to about 18 to 24 hours' normal incubation. In the infertile egg this condition can be recognized by the increased color of the yolk; when held before the candle it will appear heavy and slightly darker than the fertile egg.

"(b) Shrunken egg: This class of seconds can be easily distinguished by the size of the air cell. It may occupy from one-fifth to one-third of the space inside the shell. The holding of the eggs for a sufficient length of time to allow a portion of the contents to evaporate is the main cause of this condition.

"(c) Small egg: Any egg that will detract from the appearance of normal eggs on account of its small size will come under this class, although it may be a new laid egg.

"(d) Dirty egg: Fresh eggs which have been soiled with earth, droppings, or egg contents, or badly stained by coming in contact with wet straw, hay, etc., are classed as seconds.

"(e) Watery egg: Those in which the inner membrane of the air cell is ruptured, allowing the air to escape into the contents of the egg and thereby giving a watery or frothy appearance.

"(f) Presence of foreign matter in eggs: Small blood streaks or clots. This condition is found in many fresh laid eggs. Often eggs are laid which show small clots about the size of a pea. These are sometimes termed 'liver' or 'meat' spots.

"(g) Badly misshapen eggs: Eggs which are extremely long or very flat, or in which part of the shell's surface is raised in the form of a ring; in other instances a number of hard, wartlike growths appear on the outside of the shell.

"Spots: Eggs in which bacteria or mold growth has developed locally and caused the formation of a lumpy adhesion on the inside of the shell. There are three well recognized classes of mold spots—namely: white, brown, and black. In cases where an infertile egg has been subjected to natural heat for a sufficient period of time, the yolk will often settle and become fixed to the membrane. This condition might be termed a 'plainspot.'

"Blood rings: Eggs in which the embryo has developed to a sufficient extent so that it is quickly recognized when held before the candle. It has been found that it requires between twenty-four and thirty-six hours of incubation under a sitting hen to produce this condition.

"Rots: Eggs which are absolutely unfit for food. The different classes of rots may be defined as follows:

"(a) Black rot: This is the easiest class of rots to recognize and, consequently the best known. When the egg is held before the candle the contents have a blackish appearance, and in most cases the air cell is very prominent. The formation of hydrogen-sulphide gas in the egg causes the contents to blacken and gives rise to the characteristic rotten egg smell, and sometimes causes the egg to explode.

"(b) White rot: These eggs have a characteristic sour smell. The contents become watery, the yolk and white mixed, and the whole egg offensive to both the sight and the smell. It is also known as the 'mixed rot.'

"(c) Spot rot: In this the foreign growth has not contaminated the entire egg, but has remained near the point of entrance. Such eggs are readily picked out with the candle, and when broken show lumpy particles adhering to the inside of the shell. These lumps are of various colors and appearances. It is probable that spot rots are caused as much by mold as bacteria, but for practical purposes the distinction is unnecessary.

"To all intents and purposes the spot rot, as explained above, is practically the same as the brown and black spots described under the general head of 'spots.' The spot rot is also placed under

the general head of rots simply because some candlers will call it a spot, while others designate it as a spot rot. Pink and blood rots are names which are also applied to certain classes of rotten eggs, the pink rot deriving its name from the peculiar pinkish color of the contents when held before the candle. The same is true of the blood rot, which is bloody or red in appearance."

If those producing eggs for market purposes will carefully study the foregoing and then grade their eggs before sending them to the market, better prices will be obtained and a reputation will be made which is bound to result beneficially to the producer.

CHAPTER XXXIII

FATTENING—KILLING—MARKETING

THERE is still much education necessary along the line of poultry products. The majority of people think all market poultry is alike and, aside from the age of the fowl, there is no difference in the eating quality of such products placed on the market. This is due to the fact that they have never had an opportunity to judge the difference between a chicken raised on farm range and one which has been brought up in reasonably close confinement and possibly fattened before being shipped to the market.

The people in New England and the eastern states are better posted along these lines, because the poultry raisers there have educated the public on the subject. Western poultry raisers wonder why these easterners get better prices than they do for their market poultry and eggs. The answer is, they furnish the quality, which entitles them to top-notch prices. In other words, quality fixes the prevailing prices.

Poultry raised on unlimited range becomes muscular. The greater the range the dryer and tougher the flesh, whereas the same kind of poultry raised in confinement and forced with easily digested food will have tender, fine grained flesh and good flavor.

When a person once tastes these two kinds of poultry meat the difference will be so pronounced that he will gladly pay the difference in price and will demand that poultry raised for his table must be raised on so-called scientific principles.

In catering to a high class of trade for both poultry and eggs, a very important item is the manner of preparation for shipping to market. Appearance counts for a great deal and goes a long way towards satisfying a particular customer.

One of the most important items in the marketing of dressed poultry is the killing and preparation of the fowl. Fowls that are not properly killed and dressed for the city market will not command the best prices. Careful attention should be paid to every detail.

Always take the birds off the roosts at night. This will prevent the trouble of chasing them about the place. Put them into a comfortable coop or cage where they should be kept for about thirty-six hours before killing. Give them feed in the morning, one good meal, and then do not feed anything until killed, but see that they get plenty of fresh water.

Hang the fowls by the feet at a convenient height, then lock the wings together to prevent flapping. Take the tips of the wings in the right hand and strike a hard blow on the head with a stick or cudgel. The fowl should then be grasped by the

comb or feathers on back of head. This should be done with left hand, while with the right hand you insert the blade of a sharp knife in the neck back of the ear lobe, running the blade through the neck. In withdrawing the blade give it a twist so as to sever the artery in the throat, which will cause the blood to flow freely.

When this is done lose no time, but start in to pluck immediately. Pluck up the breast and up the side to tail, unlock the wings and strip them also, remove the feathers from the back, and then finish the job by plucking. If this work is done quickly the feathers will come out easily and there is then no danger of the skin being torn.

If your market demands a drawn fowl, cut a slit about an inch long back of vent and parallel with it, insert index finger, and remove intestines. The egg sac and lower end of the intestines may be removed by enlarging the slit to a half circle so that it joins the ends of the vent. Cut off the head, draw the skin back about half an inch, and cut off that much of the neck bone, then pull the skin forward and tie.

If the fowl is to be used for home consumption, many prefer to remove the feathers by scalding. To do this properly is to take the fowl by the neck and legs, dip into hot water twice, one dip with breast down and one with back down, then hang the fowl up and pluck. After the feathers have been removed

and the fowl drawn, throw the carcass into boiling hot water for about ten seconds, then put it into ice cold water for about ten or fifteen minutes.

In shipping to market, pack as neatly and cleanly as possible, and never pack for shipment until all the animal heat is gone.

People who have not the time or inclination to dress and prepare their poultry correctly should sell them alive. Of course, live poultry does not demand quite as good a price, but saves the poultryman much work.

In the fall of the year many poultry raisers have selected their next year's breeding stock, and are ready to sell the surplus for table use. If a little attention is paid to getting such stock in the best marketable condition, better prices and more profits can be made from this surplus.

It does not necessarily require very much additional expense to fatten poultry for market, providing, of course, the right method is used to bring this about. The extra labor also is not worth mentioning, and will be paid for tenfold in the additional selling price added to each fowl.

First of all, the birds should be taken off the range, or out of the exercising pens, about three weeks before they are to be sent to the market, and put into small coops or pens, where they are deprived of exercise. Next build a V shaped feeding trough, the same as the farmers use for hogs, only smaller.

Into this place the fattening mash, three or four times daily.

For the city man it is handier to use one of the many commercial mashes, to which should be added skim or butter milk, and to every ten pounds of meal mash add one-half pound of animal fat, such as lard, tallow, or suet. Melt the lard and stir into the batter. This batter should be mixed to the consistency of pancake batter. If the fowls show signs of getting tired of animal fat diet, the same amount of sugar may be substituted. Any kind of low grade sugar will answer the purpose, or even molasses may take the place of the former. Do not forget to put a little salt in the batter, and once or twice a week add a little ground charcoal. Green food of any kind should be avoided during the fattening process. When the first signs of a bird getting off its feed are noticed, such bird should be taken from the fattening pen and either sent to market or again put on the range until it recuperates.

CHAPTER XXXIV

LICE—MITES—FLEAS

THERE are three common pests which are liable to infest the poultryman's flock at any time—lice, mites, and fleas. Of the former there are at least a dozen species to be found on our domestic fowls, which includes hens, ducks, geese, turkeys, pigeons, guineas, peafowls, and pheasants.

Poultry keepers who wish to attain any degree of success with their flocks must combat these pests the year around. Prevention is the sure way to keep them from doing any damage at all.

Keep your birds free from lice is advice easily given, but not so easily carried out. Even fowls kept under the best conditions may at some time or another become infested with vermin. They may be transmitted from the neighbor's flocks or may be brought on the premises by sparrows or other birds of the air. It is therefore of the utmost importance that the poultry keeper be alert always and examine some of his birds occasionally so as to detect their first appearance if possible.

Lice and mites will increase at an alarming pace and the least neglect in this direction may result in spreading these pests throughout the flock in such

numbers as to make the work of extermination a most difficult task. On the other hand, if the poultryman is on the lookout for these parasites he will detect them at such time when the application of lice powder or other lice killers will rid the fowls of the trouble makers before they have a chance to get a good foothold.

Lice live, sleep, and eat among the feathers of the birds; they lay their eggs on the shaft of the feather, mostly near the vent, and the heat from the fowl's body does the incubating of these eggs. The only chance a hen has in combating these pests is the process of a dust bath, either in fine road dust or ashes. The active fowl can destroy many of the lice, which breathe through the tubelike openings in their bodies by dusting, but insects which live on the blood or gnaw the skin of the fowl seldom are killed unless given the proper treatment by the poultry raiser.

The "dust box" is without a doubt one of the most valuable contrivances and no poultry house or ward should be without one. It is one of the necessities which can be supplied at little or no cost save the few minutes' time it takes to keep it clean and refilled. This box should be kept in a dry place, preferably in the scratching shed. Setting hens should also not be neglected in this respect; they need the dust bath as well as the laying hens and growing chicks.

The chief preventive against the ravages of these

pests of the poultry house is cleanliness. A house kept scrupulously clean is not an inviting place for them to harbor in; filth is what they thrive on and filth causes them to multiply rapidly.

Either whitewash the house thoroughly each spring and fall or line it with tar paper, to be applied fresh each year. In whitewashing a poultry house every crack and crevice should be reached with the fluid, and the nesting boxes should come in for a liberal coating.

Insects lurk in the cracks and crevices; mites will house in these during the daytime and come out during the evening attacking the fowls on their roosts at night. A strong solution of one of the tar product disinfectants applied freely with a spray pump throughout the house and nesting boxes will assist greatly in the work of prevention. There are also some good lice paints upon the market which may be used effectively on the roosts, nesting boxes, and around the dropping boards.

A liberal use of some reliable lice powder will, if properly applied, rid a flock of these pests. One application will not do it, it must be repeated a few times at least to have the desired effect. The first application may kill all lice on the fowls, but the eggs, which are not harmed by the lice powder, will hatch and a new crop of lice will make their appearance.

Thus it will be seen that it is absolutely necessary

to repeat operations in this direction several times before any one can be certain the lice have been completely exterminated.

The work must also be done thoroughly, the powder must be well dusted into the feathers and every part of the bird's body must be reached. Do not hesitate about using lots of lice powder in the nesting boxes; sprinkle it on the nesting material, it will not affect the hen eggs in the least.

So-called "lice killing nest eggs" or moth balls are apt to transmit their disagreeable odor to the eggs, which may be tasted when they are prepared for the breakfast table. Tobacco stems placed in the bottom of the nesting boxes and covered with clean straw have been found good, and are to be had at a reasonable price from any cigar factory.

Never put a newly purchased fowl in your hen house to mingle with your flock until you have examined it carefully, and as an extra precaution dust it well with lice powder. By placing a fine wire mesh on your windows you lessen the danger of sparrows carrying these insects into the hen house.

There is more danger of lice during warm weather than at any other time, hence in summer use every precaution to keep these pests from invading your flock.

The so called "Red Mite," although one of the smallest insect which infests poultry, is, without a doubt, the most troublesome. Notwithstanding the

fact that this parasite is called the red mite, it is only red when it is filled with blood—at other times it is gray with black spots.

These mites at times become very serious as they multiply with wonderful rapidity, and especially is this true during the summer months. When a poultry house once becomes infested with these pests it demands vigorous action—half-way measures will not do, it means a fight, and a hard one.

The red mite works at night; it crawls forth from its hiding place and attacks the fowls while they are at roost. Hundreds of these may prey upon a single hen, fill themselves with blood, and then crawl back to their hiding places contented until the next night. During the day these parasites lie dormant in the cracks and crevices about the hen house, hence they are not so easily detected by the novice.

I have known cases where setting hens died while sitting upon the nest, traceable to no other cause than red mites, which have been assisted in their propagation by filth, which has been allowed to accumulate in the nesting boxes and the floor of the hen houses. Dark, dirty and damp houses are especially adapted for the breeding of these insects and offer favorable conditions for their rapid multiplication.

By paying a visit to the hen house at night, and being equipped with a good light, these pests may

be detected. If any are found, get busy, clean out every part of the house, overhaul the nesting boxes, burn up the nesting material, take down the roosts and paint them with lice paint, or wash them off with a strong solution of disinfectant. Those having no lice paint or disinfectant at hand may prepare a good substitute as follows: One pint of crude carbolic acid added to one gallon of kerosene. Do not be afraid to apply freely with a brush or spray pump; get either of these solutions into every crack and crevice, and soak the wood thoroughly. Whitewash the walls and ceiling with a mixture of one pint of crude carbolic acid to every five gallons of the whitewash, and apply freely and thoroughly, reaching every part of the interior. If your house has a wood floor disinfect it thoroughly, or scatter some air-slacked lime over it and sweep it well into the cracks. Care should be taken to have the lime well air-slacked, otherwise the fowls may pick up the larger particles of lime, a dangerous article for them to get into their crops.

Another simple remedy to rid the hen house of mites, and one which is quite frequently used, is fumigation with a sulphur candle, or powdered sulphur mixed with shavings, placed into an iron vessel, and then ignited. Be sure to lock every fowl out of the house, and close the building, doors, windows, ventilators and everything, light the candle or powdered sulphur and make a quick retreat. The

fumes are deadly to all mites, the common hen lice and any other kind of vermin about the premises. After the sulphur is burnt out, ventilate thoroughly before permitting the birds to re-enter.

There are other remedies used for ridding a hen house of mites, but I believe the two foregoing are the simplest and least expensive; either one, if properly done, will do the work effectively. Candidly, I believe there is no reasonable excuse for any modern poultry keeper to be troubled with mites. Keep the houses clean, well sprayed with disinfectants, or whitewash, paint the roosts every week with lice paint or the kerosene-carbolic mixture mentioned above, change the nesting material often, and dust it well with insect powder. Always keep in mind that a house kept in sanitary condition is no inviting place for mites or any other parasites.

CHAPTER XXXV

CAUSES OF DISEASE

DISEASE has caused more discouragement in the poultry business than any one thing. Much of the pleasure of raising good poultry is lost when the breeder sees one bird after another fall a victim to disease. Disease has dealt the death knell to many ambitions and has been the cause of the retirement of many poultry raisers with otherwise bright futures before them.

Disease does not come without a cause and in nine cases out of ten this cause is neglect or carelessness. True, we sometimes find a sick bird in the best regulated flocks, where everything is done to keep the poultry in the best possible condition and where the buildings are constructed on the most up to date, scientific plans. But these cases are exceptional and the disease, in these cases, never gets much headway.

The trouble with most inexperienced poultry raisers is their inability to detect disease in its earliest stage, and when they do detect it the malady has a good hold upon the specimen affected; or perhaps it is of a contagious nature, which means the infection of the pen mates. If amateurs would study their birds more closely and carefully watch their daily

actions there would be less trouble along these lines.

There are many things which bring about diseases. Among them are poor ventilation, direct drafts, overcrowding, irregular feeding, dirty houses, contaminated runs, filthy drinking water, damp quarters, and lack of exercise. Any one of these may cause the poultryman lots of trouble, and any one of them can be avoided if the proper interest is displayed in the raising of chickens. Some of these causes for disease must be considered when the first start is made. Take, for instance, the construction of the hen houses. In laying out the poultry plant hygienic construction should be carefully considered in all of the plans. Interior fixtures such as nesting boxes, roosts, etc., should be removable so that the houses can be thoroughly cleaned and disinfected. The drinking fountains and feed hoppers should be of such a pattern as will permit handy cleaning by the operator. To be brief, much of the prevention of disease lies in the kind of houses and fixtures that are used.

A sick hen will not lay, even though her ailment is not severe. Nor will she lay immediately after recovering, and hens that have had a severe case of canker or roup are not fit for the breeding pen. They should be killed and burned. In mild cases of the latter disease it is advisable to doctor them, but unless the case is mild they are not worth the trouble.

With the coming of the fall there will be many cases of cold, which if not taken in hand promptly will go into roup. I would suggest that poultry raisers have a solution of permanganate of potash on hand for such emergencies. This solution is made by dissolving one ounce of permanganate of potash in three pints of water. When a bird shows signs of having a cold, dip the bird's head into this solution. Repeat this operation every day until the bird is cured.

CHAPTER XXXVI

BOWEL TROUBLE IN CHICKS

THE most common disease among chicks is bowel trouble. Thousands of small chicks succumb yearly from one form of this disease called "white diarrhœa." Its appearance in a flock will cause alarm to the experienced poultry raiser for he knows how rapidly it will spread, and the havoc it is liable to bring about.

Some poultrymen claim that this disease is more prevalent among incubator hatched and brooder raised chicks. Close investigation has proven the fallacy of such an assertion. Hen hatched and reared chicks are just as liable to this disease. Of course an improperly heated and ventilated brooder has much to do in bringing on this disease, which accounts, no doubt, for some poultrymen making this claim.

Certain weather conditions make the chicks more susceptible to bowel trouble, damp, gloomy days, or exceptionally hot days in summer are more favorable for its appearance. Improper protection from dampness, insufficient heat, or exposure to hot sun rays without the proper amount of shade

during very hot days bring about conditions which tend toward breeding this disease, and assist materially in spreading it more rapidly.

Bowel trouble in most cases is nothing more or less than acute intestinal indigestion caused by the inability of the intestinal organ to properly digest the foods, and the thus indigested food acting as an irritant results in diarrhœa.

Impure drinking water is one of the causes of this disease. Chicks must have clean, pure water; it is just as important to them as it is to human beings. Drinking fountains which cannot be easily cleaned and scoured should never be used at any time. Vessels into which chicks can step should also be avoided. During warm weather fresh water should be supplied several times during the day, and such water should be protected from exposure to the sun, and the scratchings of the litter.

Chilling is one of the common causes for bowel trouble. During cold weather chicks require more heat than in warmer weather. When the outside temperature is below the 50 degree mark there is little danger of overheating the brooder chicks, and the flock will not be much affected at a temperature even as high as 112 to 115 degrees, which is 9 and 12 degrees higher than that of an incubator during its operation. But on the other hand, if the outside temperature is above the 70 mark, long exposure to a temperature of over 100 degrees is

very apt to effect the flock quite seriously, and also cause bowel trouble. Chicks must be kept comfortably warm, and in order to carry this out successfully the hover heat must be regulated in keeping with the outdoor weather conditions.

Next to chilling, indiscretions in feeding or careless feeding are the most prolific causes of this disease among the baby chicks. Chicks must have a variety of foods, and sufficient of each so that they can properly balance their rations. Chicks fed on one grain food, or kept on short rations, and thus starved into eating something not good for them at that particular time are easy preys to bowel trouble. Good, clean commercial chick food, put up by a reliable firm, is a safe food for the chicks. The so-called chick feed which is nothing more or less than fine waste fanned from grains in the mills is, as a rule, a very poor feed, to say the least, and the most expensive in the end, for one pays for a lot of chaff and other material which the chicks will not eat.

Chicks in confinement cannot pick up the vegetable matter which they could obtain if given free range. It is therefore of the utmost importance that raw vegetable food be supplied in sufficient quantities. During the early part of the season when grasses, etc., are scarce, raw potatoes or beets are a most satisfactory vegetable food, and should be fed chopped up fine once a day. A little

fresh lettuce or tender sprouted oats is very good and much relished.

Chicks, like human beings, enjoy a boiled dinner for a change, and for this purpose boiled cracked rice, or wheat with a little salt seasoning cannot be surpassed. In every case these grains should be boiled almost dry and fed when cool, but should not be given as a regular diet.

When the first symptoms of bowel trouble are noticed in the flock take some scalded sweet milk into which mix a little grated nutmeg, and give them all they want of this to drink in place of water. Feed them on boiled rice, sprinkled with fine bone meal, until the symptoms have disappeared. If this treatment does not check the disease it is advisable to resort to some reliable diarrhœa remedy, separate the sick from the healthy, and thoroughly disinfect the brooder and run.

After all, it is easier to prevent the disease, by following the foregoing suggestions, than it is to cure it.

CHAPTER XXXVII

LEG-WEAKNESS

LEG-WEAKNESS in a flock of half-grown chicks is due to several causes. It generally makes its appearance in flocks ranging from three to six months of age, and the cockerels are more apt to be affected than the pullets.

One of the causes is the over-feeding of fat-producing foods. The weight of the body being increased to such an extent that the legs are unable to properly support the extra weight thus created. Poultry raisers bent on saving time to bring their flocks up to broiler weight often overdo the forcing process to such a degree as to cause such disease.

The larger the variety the greater the tendency for leg-weakness through feeding. The smaller breeds being more active are not inclined to take on flesh as rapidly, they are too busy running about and scratching, provided, of course, the opportunity to do so is given them. For instance, the percentage of leg-weakness cases in Leghorns is very small, and when a case makes its appearance it is generally attributed to other causes than the over-fattened condition of the body. Even Leghorn chicks in close confinement, but given plenty

of scratching material, are seldom affected with this malady. If the stock from which the chicks have been bred is vigorous, Leghorn chicks will keep active under almost any conditions. It is a natural born instinct for them to keep scratching; they are bound to keep busy some way or another from morning until evening. What is true of the Leghorns in this respect is also true of the other smaller breeds.

Chicks of the larger breeds should be given more of an opportunity for exercise. The runway should be larger, the feeding should be done more carefully, and every opportunity offered them to keep them busy. Feed the grain feeds in litter, or scatter it amongst the loose earth so that they are bound to keep digging for it. Where the chicks are kept in rather close quarters, it is advisable to dig up the soil, scatter the grains over this freshly dug up soil and then run a rake over it. This is bound to cause activity, in other words, the chicks must work for every particle of grain they get. Chicks put on range, on the colony house plan will, as a rule, get plenty of exercise running around hunting bugs and grasses, but the city man has not the space to afford his growing stock such an opportunity to forage for themselves, hence he must, to a certain extent resort to the artificial.

Another cause for leg-weakness is the feeding of too little bone and muscle forming foods. Chicks

which are deprived of getting plenty of insects must be given animal matter. Raw meat, ground up, fed a few times every week is very beneficial to them. Beef scraps, of good quality, free from a musty smell, and containing a good percentage of granulated bone should be fed to the chicks in a hopper provided for that purpose. I would not advise mixing the beef scraps in the ground food as it has a tendency to make it mouldy, the best method is to feed it in a hopper by itself. Granulated bone may also be purchased separately from the beef scraps, and that can be mixed with the grit and charcoal. Skimmed milk is also very good for chicks, and helps to build them up. Wet mashes should be avoided.

Chicks kept on board floors too long, and not given soil to run on are liable to become afflicted with leg-weakness. When chicks reach the age of three weeks they should be given access to an outdoor run, they need lots of fresh air and fresh earth to scratch in. During the early spring when weather conditions are such that this is impossible, it is advisable to either spread a layer of soil on the board floor, or provide a large shallow box filled with soil.

The observant poultry raiser will usually notice the first symptoms of leg-weakness, the chick will show signs of unsteadiness in walking, and its leg muscles will appear working at a disadvantage.

Within a few days the chick will hesitate about walking very much, and resume a sitting position while feeding. During the first few days this disease does not affect the appetite, nor does it affect the general appearance of the bird, it simply appears weak on its legs, but as time goes on it becomes weaker and, not being able to get about, it is trampled on and pecked by its mates, and soon becomes thin and louse ridden.

Do not neglect to take the chick in hand when the first symptoms of this disease appear. If the bird comes from vigorous stock, it is not a difficult task to put it on its feet again. Find the cause and correct that first of all, give one-half teaspoonful of tincture of nux vomica to every quart of water, and rub the legs with tincture of arnica. Do not feed any corn—use wheat, steel-cut oats and bran until the hens are in the best condition, and show no further signs of leg-weakness.

CHAPTER XXXVIII

EGG-BOUND

EGG-BOUND is a condition of the egg passage affecting more frequently hens of the heavier breeds. Active fowls, such as Leghorns, Minorcas, Campines, Hamburgs, Anconas, and others of the smaller breeds are seldom troubled with this ailment. The cause is attributed in most cases to an overfat condition, which produces a pressure upon the egg passage, resulting in the difficult performing of its proper function. Sluggish fowls, those which have been closely confined without being given the necessary artificial exercise, are common prey to this disease.

Sometimes the muscular tissue is replaced by streaks of fat, which weaken the muscles of the egg passage and, by straining, the weak walls give way, permitting the egg or its contents to pass into the abdominal cavity. This condition produces inflammation, followed by peritonitis.

Occasionally the poultry raiser will find a dead hen on the nest, which has died without an apparent cause, but upon close investigation it will be found that there was an egg-bound condition which resulted in a weakening condition of the heart. The fatty condition of the bird has affected the muscles

of the heart, and the extra strain was too severe upon these muscles.

Overfat hens are apt to lay double yolk eggs, which adds to strain and difficulty in passage. At times eggs may get broken while passing through the oviduct and will obstruct the passage of the other eggs. Pullets may become egg-bound for a few days in endeavoring to pass their first eggs, but such cases generally will adjust themselves within a few days and need no treatment.

An egg-bound condition may result in inflammation of the egg passage, which is quite a serious disease. The hen thus affected has a constant desire to strain, and this strain is at times so violent as to cause the breaking of a blood vessel and result in the bird's sudden death.

If the poultryman would watch his flock closely there is little danger of inflammation of the egg passage. When a hen is detected moving about slowly, going often in the nest without dropping an egg, and the tail feathers are seen to be lowered, take her in hand, watch the movements of the muscles at the vent, and you will notice her efforts to eject an egg. Oil your finger and pass it into the passage; you will readily detect the muscular movements and in most cases touch the egg.

One of the simple treatments which has proven effective is to hold the hen with her vent over a steaming dish of boiling water. Should this not

be effective enough to relax the parts for the delivery of the egg, inject a small quantity of olive or sweet oil. While the hen is undergoing this treatment, feed her on soft, unstimulating foods, and give her a half teaspoonful of linseed oil every few hours. After the egg has been removed should there be any signs of inflammation, syringe the passage with a weak solution of carbolic acid. Keep the fowl in a quiet place, away from the rest of the flock.

An overfatty condition is also the cause for the laying of soft shelled eggs. Sometimes it is caused by the overstimulation of the egg organs, brought about by the overfeeding of too much spice, which is apt to cause irritation of the egg passage.

Closely confined fowls not supplied with a variety of food are more liable to lay soft shelled eggs than those having plenty of range or supplied with exercise in an artificial way and fed a variety of grains in a well-balanced ration. Oyster shells, grit, and plenty of green foods will assist greatly in preventing such conditions of the egg organs.

If your hens are too fat provide a diet low in fat-producing elements, make the birds work for what they get, and put one teaspoonful of sulphate of magnesia to every pint of drinking water twice a week for a few weeks.

Should the hens still persist in laying soft shelled eggs add five drops of fluid extract of ergot to

each quart of drinking water every other day for a period of one week. Do not have any other water around while giving them the mixture, otherwise the fowls will not touch it.

CHAPTER XXXIX

FROST-BITE

EXPOSURE to low temperature is the direct cause for frost-bites, or commonly called frozen comb, and the high single-combed varieties of poultry are more easily affected than the smaller and rose, or peacomb, varieties. The single-comb Leghorn and all similar varieties must for this reason have special attention during severe cold weather or they are bound to be victims to this ailment. Under-feeding increases the danger materially, and fowls of low vitality are more subject to affection.

Fowls which have not been too closely housed from the beginning of the colder weather, and which are given an enclosed, curtain-front roosting compartment, will in most cases withstand the severest winter nights without having their combs affected. Of course, it must be understood that the house is well constructed, free from drafts and dampness.

A common mistake is building the roosts too close to the glass windows. Glass draws frost, and for this reason it is not advisable to have too much glass in a roosting house. All glass front poultry houses are very warm during the day time when the sun beats into them, but they are also exceptionally cold

at night; in other words, the temperature of the house goes from one extreme to the other. Such a condition is bound to produce many cases of frost-bite.

Fowls may also have their combs frost-bitten during the day time, provided they are permitted to run in unprotected runs during stormy, zero weather. It is therefore advisable to keep the birds in the houses and scratching sheds during the severest days. Poorly constructed fountains are often the cause of frost-bitten wattles, the latter becoming wet and then exposed to the cold winds, which is liable to result in a pair of frozen wattles.

When a comb is frost-bitten, it turns purple, and in severe cases black; in the latter condition it is almost impossible to keep the affected part from falling off. As soon as the first symptoms of a frozen comb are apparent, no time should be lost. The bird must be taken in hand promptly; apply some snow to the affected parts, or, if this is not at hand, some cold water will serve. Use freely until the frost is thawed out and the circulation is restored; after which apply, mornings and evenings, a mixture of six parts vaseline or lard, two parts glycerine and one part turpentine.

A bird affected with frost-bite should not be immediately put into a warm room or placed where the sun will reach it; the main point is to start the circulation gradually.

CHAPTER XL

RHEUMATISM

THIS disease in most cases affects the legs, although it may affect any part of the body. The causes of this ailment are exposure to dampness and cold, the feeding of too much animal matter and not enough vegetable matter; or it may have come down from ancestors with rheumatic tendencies. It affects both the old fowls and the chicks, the latter at brooderage.

The symptoms are a contraction of the muscles of the legs, which draws up the toes and flexes the shanks on the knees, and whenever the bird tries to straighten itself, it seems to have a severe pain. Inflammation and pain in the muscles and joints causes the bird to sit down most of the time, and in most cases the joints will be swollen.

Remove the ailing fowls to dry, sunny quarters, with plenty of straw or other dry litter, and care should be taken to keep this litter dry by protecting the drinking fountains. Give them as much vegetable matter as possible, and feed sparingly on animal matter. Rub the swollen joints and muscles with witch-hazel, and give them 15 grains of iodide of potassium to every quart of drinking water.

Brooders so constructed as to supply the heat from the bottom are very apt to cause rheumatism in the chicks; keeping chicks in damp basements, or permitting them to run on cold cement floors, is another cause. Chicks are very liable to succumb to this disease, whereas there is less danger of losing the grown fowls unless the disease should go to the heart.

CHAPTER XLI

ROUP

ROUP has caused more havoc in poultry keeping than any one disease. Thousands of fowls succumb annually from its ravages, and entire flocks are wiped out or made useless for future breeding purposes. It is very contagious, and one infected bird may spread the disease throughout the flock in a very short time.

Many inexperienced poultry keepers mistake a severe cold for roup. A neglected cold may develop into a case of roup; hence, a fowl suffering from a cold, be it ever so slight, should not be passed by lightly, but should be taken in hand and treated. This malignant disease is more prevalent during the fall and winter months, especially when the weather is cold and damp. Summer cases are not so common unless the hens are kept under insanitary conditions. Filthy, damp quarters, too close housing, and unclean drinking vessels are breeders of this disease. Roup may also be inherited from parent stock which has been affected with it, and not properly cured. A run-down flock with low vitality is an easy prey to its ravages.

The common symptoms of roup are a discharge of the nostrils, which thickens as the disease progresses;

watery eye or eyes, which gradually swell and later close entirely; the head, in advanced stages, will become swollen, and the bird has difficulty in breathing. I have seen specimens completely blind with this disease, and in such condition were unable to partake of food. The last stages of this disease are often accompanied with diarrhœa, which results in quick death.

A roupy bird must be treated in its early stages in order to effect a complete cure and one that will not show its after-effects. Severe and advanced cases have been cured; but personally, I would not care to breed from such birds, even though the fowls themselves, from all outer appearances, seem perfectly healthy. The trouble with this disease is that it may seem entirely cured, but in reality is dormant, only to break out again when least expected.

Roup should not be trifled with; it must be vigorously treated; no half measures will do. It must be stamped out, and stamped out completely. Do not let any one make you believe that roup is easily cured, and that it is nothing more than a severe cold, which can be speedily eradicated by local external application on the infected parts. Such is not the case; to obtain the desired result—a permanent cure —requires both internal and external treatment.

In the treatment of roup, the first step to take is precaution. Remove all infected fowls from those showing no symptoms. Thoroughly disinfect the

houses and pens from which such birds have been taken; boil out the drinking vessels; clean and disinfect the feed hoppers and other utensils used by the diseased specimens. Put some permanganate of potassium in the drinking water—just enough to turn the water a light red color. Watch the flock closely; look over each bird daily for new victims, and go into the hen house at night to listen to their breathing.

There are many successful treatments for roup, but I will only give two simple remedies which I have found will cure severe cases.

Prepare a solution of one part peroxide of hydrogen to five parts of water, with which bathe the head and eyes twice or three times daily. Take a medicine dropper and pour some of this solution up the nostrils. It may be necessary to clean off the hard, putrid matter in nostrils before it can be injected. Give the bird nothing to drink but the potassium water mentioned before, until cured, after which some reliable tonic will be found very beneficial.

Another simple remedy is to float some common kerosene oil on the top of a pail of water and dip the bird's entire head in this solution for a few seconds twice daily. I would also advise the potassium drinking water with this treatment.

Another form of this disease is called diphtheritic roup, which is very contagious and difficult to cure. It affects the mucous membrane of the nasal passage, throat, mouth and eyes. Yellow patches will form

on the affected parts, which give forth a foul odor. These patches grow rapidly in size, often filling the mouth and throat so as to cause suffocation.

There is only one remedy to suggest for this disease, and that is the hatchet, as birds thus infected will never be fit for breeders, nor will the hens ever amount to much as layers.

Diphtheritic roup may be detected by its very offensive odor. It is claimed that this form of roup may be transmitted to the party handling such birds. This is another reason why all birds thus affected should be killed and not treated.

CHAPTER XLII

LIMBERNECK

LIMBERNECK is a partial paralysis of the neck muscles, the bird losing all control of the neck muscles. A fowl thus affected may be able to lift its neck at times, but generally the crown of the head rests on the ground between its legs most of the time.

Intestinal irritations are, in most cases, the direct causes of this disease, and frequently it is accompanied by acute indigestion, intestinal parasites, attacks of colic or crop inflammation. The eating of putrid meat or maggots are common causes, and sometimes feeding on one grain or a sudden fright may bring on this disease. Fowls running upon old contaminated ground which has not been spaded or properly renovated may also contract the disease. Chicks and fowls of all ages are subject to this disease, and no particular part of the country is exempt. A very successful treatment for this disease is to give an adult fowl a mixture of one teaspoonful each of turpentine and sweet oil, and chicks three to twelve drops of each, according to the age of the victim. In about a half hour this should be followed by some warm milk, to which has been added a liberal sprinkling of black pepper. This should be

repeated at intervals of every two hours, a half teaspoonful for chicks and a tablespoonful for adult fowls. As soon as the patient has sufficiently recovered, it should be put upon a boiled rice diet, followed by raw vegetable feeding, a little grain and beef scraps.

Where this disease is caused from an epileptic or brain trouble, the foregoing treatment will not effect a cure, and in such cases it is advisable to kill the bird.

CHAPTER XLIII

GAPES

GAPES is a very common and troublesome disease amongst both chicks and fowls. It is a parasitic disease, and has the appearance of one worm, reddish in color, but upon a closer examination it will be found to be two worms, male and female, linked together. These worms fasten to the lining of the windpipe, and in that position suck the blood from the victim. It seems to be more dangerous to chicks from one to six weeks old. Death generally results from loss of blood and debility, or a large number of worms may cause suffocation.

The disease spreads easily, because there are several thousand eggs in the female worm, which are not laid but which escape by the bursting of the female's body. At times these develop into worms in the bird's windpipe, but are more often coughed up and thus picked up by other birds through the food, water, or the ground.

The presence of gapes is noted by frequent gaping, coughing, sneezing and whistling, and weakening, dumpish condition of the chick or fowl. Badly affected birds cough as though suffocating, shake their heads frequently, and often stand with wings drooping, eyes closed, and mouth open.

When this disease is discovered, stringent measures must be adopted to prevent contagion of the entire flock. Where chicks or fowls are kept in runs, these runs must be thoroughly gone over with a strong disinfectant or air-slaked lime, after which they should be spaded over. Where the birds have a large range, such a measure of prevention is not practical, or in most cases impossible; but the houses, coops or brooders, as the case may be, and the drinking vessels and feeding troughs, must be thoroughly disinfected. Remove all the sick birds from the well ones, and put a small piece of copperas in the drinking water as a preventive.

The treatment most commonly and most successfully used is extraction. This operation requires some patience on the part of the operator, but it is simple, and a little practice will make a skillful operator out of the least experienced poultry raiser.

Either purchase a wire gapeworm extractor from a dealer in poultry supplies, or make your own extractor by looping a horsehair. Mix a solution of good disinfectant, into which the extractor should be dipped before and after using.

Take the bird firmly in the left hand, head placed firmly between the fore-finger and thumb, its mouth open, and its neck stretched out straight from the body. Dip the extractor in the disinfectant solution, then insert it gently into the windpipe and withdraw it with a slight twist. Most of the worms will

be extracted, and any remaining will most likely be killed by the disinfecting solution. Burn the worms extracted, so as not to be a source of danger to other fowls. Care should be taken not to permit too much of the solution on the extractor, or some of it may drop into the windpipe and strangle the bird.

Some poultrymen use the lime treatment. The birds are placed into a box, the top of which is covered with burlap; through this burlap top the air-slaked lime is slowly sifted throughout the chamber. The air becomes full of lime dust, which causes the birds to cough up the worms. Fresh air must be admitted to the box, and too much lime must not be used, or it may inflame the mucous membrane of the bird's air passage.

Personally, I prefer the use of the extractor.

CHAPTER XLIV

CHOLERA

CHOLERA is a most contagious and generally a fatal disease. It is not so common amongst poultry as many are led to believe. Too often severe cases of diarrhœa are mistaken for cholera. This disease attacks both old and young, and its progress is very rapid. It is without a doubt the most dangerous ailment to which poultry is subject, and when it makes its appearance, it requires prompt action and measures to counteract its rapid infection of the entire flock.

The symptoms of cholera are sleepiness, ruffled feathers, wings drooped, loss of appetite, an unusual thirst, over-drinking of water, high fever, legs dry and hot, pale comb, bloodless wattles and face, dull eyes, loss of strength and flesh, yellowish-green droppings, which in advanced stages turn to a grass-green color; feathers about the vent become soiled, and before the bird finally dies, it is commonly attacked with convulsions.

A treatment is almost useless, as the disease's progress is so rapid, and, therefore, as a safety measure for the rest of the flock not showing any symptoms, it is advisable to kill and burn all infected

specimens promptly. It is also a good policy to establish a pest house, away from the other poultry houses, for those birds which are inclined to be just a little dumpish, and keep them under quarantine until the danger period for showing direct symptoms has been overcome. Give these suspects one-tenth-grain tablets of corrosive sublimate to every quart of water. As a diet, give them stale bread soaked in boiled milk and well seasoned with pepper.

Where the flock and houses have been exposed to infected birds, hygienic and sanitary measures must be promptly resorted to. Lose no time in burning up all the litter in the houses and yards; sprinkle air-slaked lime throughout the houses, and disinfect the roosts, nest boxes, drinking fountains, food utensils, the runs, etc.

Another remedy quite frequently used for both cholera and diarrhœa is to mix one teaspoonful of spirits of camphor with sugar and add to each quart of drinking water.

CHAPTER XLV

SCALY LEGS

SCALY LEGS are caused by the irritation of a parasite, which makes its way under the scales of the shanks and toes. It may be transmitted from one fowl to another, from an infected house, or from the roosts.

It is very easily cured by mixing kerosene and lard and applying this thoroughly twice each day. Sulphur and lard is also very good. Rub this well into the rough parts, mornings and evenings, for at least a week.

I would also advise keeping the birds under treatment on straw, away from dirt and filth, until cured. Should a good many in the flock be infected, give every bird a few treatments with either one of the above mentioned mixtures. By following these suggestions, you will eliminate the new cases which are liable to break out.

CHAPTER XLVI

CROP BOUND

CROP BOUND is caused by the swelling of grain, or by shavings, long pieces of hay or grass obstructing the outlet and also by foods forming a hard mass in the crop. Confined fowls which are deprived of the necessary vegetable diet often eat the litter, resulting in this condition. Sometimes the fowls will eat a quantity of green leaves and some of these become packed in such a manner that the passage of the food is made impossible. The absence of grit and oyster shells tend towards bringing on this disease.

In most cases an operation becomes necessary, but I would advise trying the following treatment first: Secure a small rubber tube not thicker than a lead pencil, to which should be fastened a glass or tin funnel. Moisten the tube in warm water and insert same into the mouth and down the throat into the crop. Avoid getting it into the windpipe, or a strangled fowl will be the result. Slowly pour a quantity of warm water, not too hot, into the funnel, and keep busy working the crop with the finger so as to loosen up the contents of the crop until it is soft. Next hold the bird head downward and keep on working the crop until the mass

is worked out. After this treatment give the bird warm water to drink, feed soft and easily digested foods for a few days and add a reliable tonic to the drinking water.

If the bird does not respond to this treatment an operation on the crop is necessary. To do this properly it will be necessary to have some assistance. One should hold the bird while the other gently plucks the feathers from the breast, making a bare spot about one-half of an inch wide and two inches long, and covering the hard part of the crop. Take a sharp knife and carefully cut only through the outer skin, leaving the crop proper intact until the blood stops flowing. Then cut a small hole about a half an inch in length into the crop and from this small opening remove the contents with a small stick. To make certain no obstruction is over the outlet passage insert the little finger into the opening. Wash the wound with warm water into which drop a few drops of carbolic acid or some other good germicide. After which sew up the opening in the crop, using a needle and white silk thread. Only two single stitches are necessary, but leave both ends long enough to hang out of the crop about an inch. Then take three stitches in the skin, but don't include the crop in the tie. Feed on light soft food and keep off the grain ration for a week or ten days. A tonic in the drinking water is advisable.

CHAPTER XLVII

CANKER

THIS disease may start with a small sore and then work its way upward under the skin, producing a swelling on the outside. If you lance the part swollen you will find it, no doubt, filled with a thick, cheesy substance. You might also start from the point of the small sore and work up into it. It is absolutely necessary that you reach the seat of the trouble, and burn it out with a solution of five grains of nitrate of silver to an ounce of distilled water, but first of all remove all the yellow, cheesy substance possible. Wash this cavity out daily and use the nitrate of silver solution freely, and then saturate a piece of cotton with a good antiseptic and plug up the cavity. Mix up a light solution of permanganate of potash and add this to the drinking water, giving them no other water to drink.

This is a very stubborn disease to cure, but with persistency it may be very successfully combated. Fowls once affected with this disease are liable to produce this scrofulous disease in their offspring. This disease is contagious and may be transmitted to the balance of the flock through the drinking vessels; therefore remove all diseased birds, and put them into clean, disinfected coops.

CHAPTER XLVIII

EXHIBITING POULTRY

THE breeding of standard varieties of poultry for exhibition purposes requires considerable study and careful mating of the breeding pens. Beauty alone is no assurance of standard quality. A specimen to be eligible for the show room must conform as nearly as possible to the standard. Many amateurs think because they have fine looking birds they can show and win in competition, but when these birds are handled by an expert and carefully inspected they are found to be deficient.

There are a multitude of points to take into consideration. Even poultry fanciers who have studied the American standard of perfection carefully are ofttimes unable to make proper selections. The reason for this is their eyes are not trained for this work.

The amateur, no matter how fine a stock he has, should not attempt to do his own selecting for the show room.

There are many poultry fanciers who know the general outline of the breeds which they keep—their eyes are trained to detect a standard shaped specimen—but when it comes to the many minor points they are entirely at sea. I have known of

such fanciers finding fault with decisions at the shows, but when shown the minor defects which they overlooked they realized their inability to select properly.

Ofttimes we notice fine looking specimens which we think should have shared in the prize money, but when these birds are taken in hand and carefully gone over we find some decided defects. This also holds good in buying birds.

Most of the criticism heaped upon the judges comes from amateurs who imagine they know as much about poultry as those who have made this work, I might say, a life study. An experienced exhibiter, as a rule, very seldom finds fault with the judge's decision even if he knows an error has been made. Such mistakes cannot always be avoided.

Another thing lost sight of by most inexperienced exhibitors is putting their show birds in the proper condition. A bird, no matter how high its quality, if not groomed for the pen, will not display its good qualities. Condition means much in the judge's eyes, and many a good show specimen has met its Waterloo for the lack of it. One cannot expect to take a bird off the roost the night before shipping to the show and expect such a bird to be in show condition. Show birds should be penned in individual coops beforehand so that they will be accustomed to the imprisonment.

Exhibition birds must first of all be quite tame; then they should go through a little training so that they will stand up in position when necessary.

All birds for the show room should be perfectly clean and most white fowls must be properly washed. The legs and combs should also be scrubbed and rubbed with alcohol. After the birds have been washed put them into clean straw covered pens in a warm place. There is quite a little trick in washing birds properly and it requires practice.

Proper shipping coops is another item. You cannot expect the birds to arrive at their destination in good condition unless the right kind of coops are used for transporting them. Some poultry raisers use any kind of old box or crate, into which they crowd their stock, and the result is broken feathers, picked up combs, and sometimes disease from being exposed to the inclement weather.

CHAPTER XLIX

SHIPPING BABY CHICKS

THE traffic in day-old chicks, or what is commonly called, the "baby chick business," is not understood by the general public. They cannot understand how these little, one might say helpless, creatures can be carried by the express companies for hundreds of miles without either food or water or artificial heat. The layman, unfamiliar with poultry raising, is apt to condemn it as bordering upon cruelty to animals, but the man or woman who has given the subject any study at all will soon be convinced that such is not the case.

The shipping of day-old chicks was carried on in England some few years before it was attempted in this country, but there the distances are not so great, and it remained for the American poultry breeders to demonstrate to the world that they could be safely shipped hundreds of miles with equal success.

The day-old chick business is not a difficult thing to handle, provided several important details are carefully looked after. First, you must produce chicks with the proper vitality, and this can only be brought about by obtaining the eggs from good, healthy and vigorous breeding stock, and then the proper incubation of these eggs. Second, proper shipping boxes

must be provided, so ventilated as to prevent direct draft. Third, care should be exercised not to chill the youngsters in removing them from the incubator into the shipping boxes. Fourth, do not feed them anything at all, the yolk of the egg supplying all the nourishment necessary for the first few days.

There are several forms of boxes used for shipping by express. Some use a wooden constructed box, covered with burlap, but I much prefer the heavy cardboard, or corrugated boxes, divided into compartments holding 25 chicks each. The objection to the wooden parcel covered with burlap is that the latter sometimes gets torn in transit, permitting too much air to get into the compartment, thus chilling the occupants, or admitting too much light in one spot to which the chicks will naturally crowd, and in doing so will trample on each other, killing some and crippling others.

Every precaution should be taken not to give the chicks too much ventilation, a very small hole will supply enough oxygen to a compartment holding 25 chicks, as the lung capacity of a day-old chick is very small. Too much air will reduce the temperature of the box. The body heat of 25 chicks crowded together in a properly constructed and ventilated box will, under ordinary conditions, go as high as 95 degrees, which by the way is about the average brooder heat. The amount of light supplied should also be very limited, chicks remain-

ing more quiet when the compartment is dark, thus preventing jostling and trampling. The bottom of the box should be covered with short-cut alfalfa, clover, or straw, to the depth of about a half an inch. The lid should be securely fastened on, tied down, which will keep the curious from opening the box. Then the package should be labeled, denoting its contents.

It is very important to notify the purchaser just when the shipment is to be made, so that the party can be on the lookout for them, preventing unnecessary delay, and also making it possible to have brooder, etc., in readiness when the little fellows arrive at their destination. In cases where the shipper does not take this precaution it often turns out very disastrous.

The month of May is an excellent time to purchase baby chicks, weather conditions have settled and the germ of the eggs are stronger, thus bringing forth good vigorous chicks. May chicks develop very quickly, and it is a matter of record that many of the New York Madison Square Garden and Chicago Coliseum Poultry Show winners for several years have been hatched in the "Merry Month of May." May hatched chicks are all right, and if properly fed and cared for will fill the egg basket the following winter. Some of the very highest authorities throughout the country agree on this point.

CHAPTER L

COLOR OF CHICKS

A COMMON question asked, especially by novices, who have purchased baby chicks or settings of eggs, is regarding the correct color and markings of the newly hatched birds. It is often thought that the youngsters should exactly resemble their parents in color, and when it is found that a brood of Black Minorcas are black and white, the vender is taken to task and is condemned for sending out inferior and mixed stock, or eggs, as the case may be.

The black varieties seem to cause the most complaints, as the chicks of those breeds are generally black and white, with the white predominating. Some of those showing the most white mature to be fowls of the best black color.

Chicks of the white breeds are creamy white, milk white, and yellow white, sometimes with gray spots or marks. Light marked breeds, such as the light Brahmas and Columbian Wyandottes, have no indication of the black hackle and tail markings which will develop when they get their full plumage. When hatched barred Plymouth Rocks are sooty black on their backs and necks, white on the throats and wing tips, and have patches of grayish white on the heads.

The buff varieties of chicks have buff or yellow plumage when hatched, but a light buff chick seldom improves in color with age. The partridge colored varieties as well as black, red games, and brown Leghorns, are clearly marked along the back with a brown stripe, and on each side of this is a much lighter stripe running from the head to the tail. These varieties in many cases show white wing feathers before they molt their chick feathers in the fall.

Houdan babies are white with black markings on heads and shoulders, and have tuft on their heads, the size denoting the future crest. Houdans always have five toes. Andalusians vary from French gray to blue-black, but there are often some in a flock that are black and white. Colored Dorkings are light brown with dark stripes along the back, and the Silver Dorkings have a much lighter marking on the back.

Do not discard the chicks too soon because they happen to show some off colored feathers. These may disappear after molting time.

CHAPTER LI

MOULTING

MOULTING TIME is the most trying period of the year. Hens require special attention during this changing of plumage. The hens will stop laying, but they deserve this much needed rest, every living creature is entitled to some rest during the year. Being scant on feathers, they should be provided with good shelter, to protect them from exposure. If this is not provided, roup and other diseases may be expected.

It is always desirable to have the fowls start their molting as early as possible, so that they will be through before the colder weather sets in. Those molting early and getting through with it before the fall storms will be the early winter layers.

As soon as the hens start losing their feathers, the heavy grain diet should be cut down and more green food should be fed, green food having a tendency to loosen the feathers. Do not be worried about the hens being hungry, it will do them good to lose a little of their surplus flesh. Sunflower seed will also assist them in molting, and will brighten up the new feathers in the colored varieties. A little Epsom salts in the drinking water once or twice a week will keep them in good condition.

CHAPTER LII

HEALTHY EGGS

Does the egg contain microbes? It may or it may not. That is to say, there are eggs that appear to be absolutely sterile, and again, there are eggs in the contents of which microbes—bacteria or molds—can be demonstrated. Poppe, in 1910, working in the Royal Health Department in Berlin, came to the conclusion that fresh laid eggs derived from hens that have not copulated are mostly germ free in their contents, whereas eggs laid by mated hens, and as a rule fertilized, may contain bacteria. Poppe speaks of this conclusion derived from his own personal investigations as being a complete corroboration of a view already in good standing. That is to say, such reputable workers as Burden-Sanderson (1878), Schrank (1888), and Menini as late as 1908, had noted absolute freedom from bacteria in recently laid hen's eggs. The scientists' acceptance of this view is seen in the fact that certain workers proceeded to show why eggs were free from microbes and we find Wurtz (1890), Turro (1902), and Horowitz (1902), claiming, as a result of their researches, that the reason for this freedom from bacteria is due to the presence in both white and yolk of certain substances having

power to destroy bacteria. But Poppe, after going back to 1878, says that we have to thank Zimmerman for showing us that only fresh laid eggs derived from virgin fowls are free from microbes, whereas fertile eggs generally contain bacteria and therefore spoil more frequently than fertile eggs.

Another source of microbic invasion of the egg and its contents is to be found in the external medium. Poppe and Cao, as well as other investigators, have demonstrated that microbes gain entrance to the egg contents from dirty, moist surroundings. Enough has been done in the way of investigation to show that eggs while being kept for ordinary use before hatching or marketing should be kept in a clean, dry place.

Clean eggs laid by clean hens, in clean nests, kept clean and delivered clean to the consumer—surely, that sounds well. It is not such an idealistic notion as to be unattainable in ordinary practice.

CHAPTER LIII

START THE BOYS

WHY not interest the boys in poultry raising? Why not give them some interesting work, which will assist materially in reducing the high cost of living, and educate them in a practical way?

Most every boy has leisure hours every day, which could be utilized to good advantage not alone for his parents' sake but for his own. Give the boy some pleasant occupation, and in nine cases out of every ten he will grow up to be a good boy and develop into an industrious, bright business man.

No other vocation offers as many opportunities along this line as poultry raising.

There is lots of pleasure in poultry keeping; it has a fascination not to be found in other lines, and it offers the boy an opportunity to make money without interfering with his studies. It will give him exercise in a natural way, plenty of fresh air, and relieve his mind from his daily studies.

Poultry keeping in a small way is not what might be termed hard work, and yet it is work that must be done systematically, carefully, and diligently. The experiences gained in this way will greatly benefit the boy in his future career, even though another field of endeavor is chosen in after

years. It is knowledge that he cannot obtain through books or verbal teachings; it is good, sound, practical experience, which only comes from the daily routine necessary in successful poultry keeping. It gives him actual business ideas not to be gotten from his studies or from running about the streets with other boys.

The average boy will take readily to the work. To him chickens are pets, to start with; he likes them because they are alive; he takes an interest in feeding them, watching them run about, and soon learns that they appreciate kind treatment.

If the boy gets to that point, and most boys will, you may rest assured he will look after his charges and not neglect them at any time. Of course boys are boys and need watching, but there is little watching necessary when they keep chickens.

Most boys want pets—some dogs, some cats, some rabbits, and so on; something alive. Then, why not give them pets which not alone pay for their keep, but also net a profit and help reduce the grocery and butcher bills. There is something to such pets—yes, more to it than most fathers and mothers realize.

I venture to say if more boys in the larger cities had pets there would be less bad boys and less criminally inclined young men. If the boys had poultry to look after at home they would not be

found loitering about pool rooms. They would be home boys, under the eyes of their parents or guardians, and they would be good boys, honest boys, and kind hearted boys.

Poultry raising will make the boy thoughtful. He will soon learn that forgetfulness means loss. There are many details to this work, and all of these details are important. To carry them out successfully requires thoughtfulness and system. As he progresses in his work he realizes more and more the importance of attending to each detail, and knows that none of them can be safely forgotten.

By association with his little flock the boy learns to be kind to animals, which tends towards making him kind to his fellow men. This kindness grows on him in a natural way, and kindness awakened in this manner cannot possibly slumber in after years.

To keep poultry successfully requires some bookkeeping. An accurate account should be kept on expenses and receipts. This will give the boy a chance to get practical experience in this kind of work, and teach him to be accurate in everything which involves dollars and cents. It will also teach him the importance of being economical in expenditures, for it won't take him long to learn the necessity of holding down the expenses in order to have a surplus in the treasury.

If the boy is industrious he will learn to use tools; thus he will be able to build his own coops and re-

pair many things about the plant. He can also learn to make many of his appliances, such as water fountains, feed hoppers, nest boxes, shipping coops, roosts, dropping boards, feed bins, brood coops, etc. This gives the boy practical manual training, and at the same time saves considerably on the expense account.

Aside from the education the boy may get from this line of work, the possibilities of making money are favorable. I know of boys who are buying all their own clothes and saving money for a college education from the proceeds of backyard poultry plants. The investment to start the boy in this business is not heavy, in fact, it is much less than most parents think. Start him in a modest way, and let the little poultry farm grow with the boy.

Help him to decide on the breed to be kept. Don't let him have more than one breed to start with, and do not permit him to have anything but thoroughbred stock. He will take more interest in nice looking, well-bred birds. They will cost little more, and will do much better. It will also give him a chance to sell eggs for hatching, and surplus stock at good prices.

Either buy him some chicks or eggs for hatching. You can have the chicks shipped to you by express, and they can then be given to hens or put into a brooder, the latter preferable. Buy enough so he will have a nice flock to select from in fall. The

surplus can easily be disposed of, and of course one must make some allowances for losses.

Farmers would do well to give the younger boys a chance with poultry. If nothing more, give them one pen of good birds to start with. The boy or boys should have full charge of this pen and keep all its profits for his or their own use. It will assist materially in interesting the boys in farm life, and make them feel that they have a personal interest in at least a part of the farm.

Here is an opportunity to start your boy or boys in a business which may be the making of a successful future career.

CHAPTER LIV

THE BILLION DOLLAR INDUSTRY

THE poultry industry is correctly termed the "billion dollar industry" of this country. In dollars and cents it far exceeds the combined value of the wheat and oats crops, and these figures, compiled by Uncle Sam, only take into consideration the output of poultry on the farms, not giving any data on the output of poultry farms and back-yard poultry plants. It is hard to estimate definitely how much in round numbers these nonconsidered sources of supply would add to the grand total, but from observations the figures at hand would be greatly increased.

Quoting from government reports, seven states raised more than 20,000,000 fowls in 1909—namely, Illinois, Missouri, Iowa, Texas, Kansas, Ohio, and Indiana. The combined production from these states was more than 89 per cent of the poultry produced in the United States. Four states produced more than 100,000,000 dozen eggs—Missouri, Iowa, Ohio, and Illinois, which figures 26 per cent of the total production from the figures at hand.

Illinois is in the lead for fowls raised in 1909. The farms of this rich prairie state produced 32,352,888 fowls in that year, with a total valua-

tion of $15,404,028, which is an average of 48 cents a fowl. During the same period 100,119,418 dozens of eggs, valued at $18,940,454, an average value of 19 cents per dozen, were produced in this state.

Missouri's production of poultry amounted to 31,913,210, at a total value of $14,572,585, an average for each fowl of 46 cents. The reported total production of eggs amounted to 111,816,693, aggregating a total valuation of $19,345,602, or an average of 17 cents a dozen.

Iowa, another big poultry raising state, had an output of 29,999,147 fowls in 1909. The grand total amounting to $13,914,985, an average of 46 cents for each fowl. The total amount of eggs produced figured 109,760,487 dozens, with a valuation of $19,235,600, or an average of 18 cents per dozen.

Ohio raised 23,433,005 fowls in the same year and these were valued, as a total, at $10,997,633, or an average of 47 cents a fowl. The 100,889,599 dozens of eggs produced in that state were valued at $19,748,658, averaging 20 cents a dozen.

The report as compiled by the census bureau of the United States shows the production of 1,591,311,371 dozens of eggs, valued at $306,688,960. The production in 1899 was 1,293,662,433 dozen eggs and the value of $144,240,541, which shows while the production of eggs on the farms of this

country only increased 23 per cent, the value more than doubled, the exact amount of gain in dollars being $162,448,419, or 112.6 per cent.

The total number of farms included in this 1909 report numbers 5,655,754, or 88.9 per cent of all the farms in the United States, and the number of such fowls was 488,468,354, or an average of 86.4 fowls a farm. The total value of fowls produced in 1909 in the entire country was $202,506,272, and the total value given in 1899 amounted to $136,830,152. This shows an increase in the ten years of $65,500,000, or 48 per cent.

CHAPTER LV

USEFUL HINTS FOR POULTRY RAISERS

KEEP a careful record of your flock the year round. It is the only way to find out how much they are earning for you. Always charge yourself with all the eggs and fowls used in your own kitchen; otherwise, your record will not be accurate.

Keep a sharp lookout for rats and cats. Don't grow chicks to feed to four-legged thieves.

Buttermilk mixed with ground foods will tone up the appetites of the fowls in the fattening pens.

Avoid feeding chick food that has been in stock so long that it is moldy. It is bound to cause much trouble.

Keep the chicks growing. If there are any drooping their little wings and sitting around, look them over carefully; they may be troubled with lice.

For egg production, pullets are the money makers in a poultry plant; hence, they should receive every attention from the poultry raiser.

To get the most out of your flocks, you must adopt present-day methods, so as to be on even footing with your competitors.

It will pay to trap-nest your hens, and keep a record of what each one is doing for the egg basket. This is a sure way to weed out the "drones."

Chicken feathers can be sold, but they do not command the prices paid for duck feathers. White chicken feathers bring the best prices.

Never frighten your fowls; keep them as tame as possible. If occasion requires you to remove a hen from the nest, do not throw her out, but lift her up gently.

Train your pullets not to be afraid of you. Fowls that are easily frightened never do so well, and cause lots of trouble about the hen house. A wild pullet is a nuisance in a well regulated flock.

A good way to test an incubator is to place eggs, selected at random from the same lot, under a hen at the same time the incubator is set and watch results.

Disinfect the brooders before putting the chicks therein. In fact, it is advisable to remove the chicks and go through with this process at least once a week.

Sanitary conditions are absolutely necessary to retain the health and vigor of the little ones.

It is a good idea to keep the pullets separate from the old hens, as the former can stand heavier feeding without danger of overfattening them. The surplus cockerels should also be excluded from the pullets if good results are to be attained.

Cleanliness in the runs is just as essential as in the houses. Too often the yards are overlooked. If the runs are bare of vegetation, they should be scraped or raked often enough to prevent them from getting filthy. Occasional spading is advisable.

Rake the litter in the scratching sheds and houses often, so as to keep it clean and sanitary. A little disinfectant sprinkled amongst the straw will also assist in keeping it sanitary. Of course, the litter must be changed when it becomes too much soiled.

Boiled rice, from which all the water has been boiled out, is good for chicks; it regulates their bowels and prevents diarrhœa. It should be fed once or twice a week—not thrown on the ground, but fed from a clean dish.

Either build the nest for the setting hen on the ground, or put some fresh earth in the bottom of

the nesting box. The eggs need moisture during incubation, and this is one of the best ways to supply it.

If the poultry keeper selects for vitality, keeps not more than ten females to each male, feeds properly, selects the eggs of proper size and shape, there is little danger of being troubled with unhatchable eggs.

Do not set the incubator in a stuffy room. Good ventilation is absolutely necessary to obtain the desired results. A basement or cellar is an ideal place to set an incubator, providing a more even temperature and more moisture.

Local market conditions have at times much to do with the variety of poultry most profitable to keep. Some localities demand a brown egg, while others want a white egg. It stands to reason that it is advisable to cater to the demands of your market, in order to get the best prices for your products.

Select the best shaped eggs for hatching purposes. Never set any rough or deformed eggs, nor eggs small in size. Have each setting as uniform in size as possible. When having eggs shipped in for hatching purposes let them rest about 24 hours before putting them under the hen.

Save your poultry manure for the garden patch. Sprinkle it with land plaster (gypsum) or coal ashes. This makes an excellent compound for a fertilizer. This manure is very valuable, and will make a big improvement in your garden soil. Try it for yourself, and you will be surprised what it will do.

An inactive, lazy cockerel or cock is not a safe bird to use at the head of a pen from which you expect to gather the eggs for hatching. Vitality counts in him just as much as it does in the female; in fact, more so, especially when only one male is permitted to run with the hens.

Eggs may be safely dipped into water during incubation, providing, of course, the water is of the same temperature as the eggs, about 103 degrees. Do not dip later than the eighteenth day. Such treatment is only necessary in the absence of sufficient moisture.

Give the growing chicks plenty of exercise. The run should be covered with short cut alfalfa, straw, or clover, to the depth of two or three inches. Scatter grain food in this litter, and make the youngsters dig for it. The chicks will enjoy the sport and will develop into strong, healthy fowls. In other words, make them work for their food.

Go into the hen house at night and listen diligently for a short while. It is a good way to detect a cold or the first symptoms of roup in the flock. Birds breathing hard or rattling in their throat should be taken off the roost and carefully examined, and, if affected in any way, removed to a coop or apartment away from the rest of the flock.

Do not let your hens get into the habit of eating eggs. This habit is one of the worst fowls can have, and it is very apt to spread very rapidly throughout a flock. By having the nesting boxes as dark as possible, there is little danger of the hens acquiring this habit; hens also prefer a dark, secluded place in which to lay their eggs.

If your method of feeding gives good results do not change it just because you read of other methods used by other poultry raisers. Various methods may be successful; conditions are so different that they demand different methods, and a poultry raiser must study the conditions of his own flock, their surroundings and the climatic conditions also.

Do not give foods of a too fattening nature during the hot summer months. A good hot-weather feed which can easily be obtained by the backyard poultry raiser is boiled table scraps mixed with bran. Feed this in a crumbly mass, and cold. For a grain food,

use oats and wheat. If the table scraps do not contain sufficient meats, add some dry beef scraps, or feed fresh meat.

Give your poultry a home of their own and don't permit them to roost on trees, in the cow barn, implement house, or other out-buildings. Build them a good comfortable house for their own use, and build it large enough for all. Do not keep more stock than your poultry house or houses will hold. Either build more houses or dispose of some of the stock. This holds good in summer as well as winter.

A very common mistake made is to pack hatching eggs carelessly. Even though the buyer is a beginner he will note the condition of the package when received by express or parcel post. If the eggs have been packed poorly, and though they have arrived safely he will not take a chance to give you a future order. Good egg shipping parcels are cheap, and should be used by everyone making a business of selling hatching eggs.

For a persistent cough try the following: Purchase from your druggist some tablets of arsenite of antimony 1-1,000 of a grain drug strength each. Give each sick fowl one tablet three times each day until relieved. If many fowls are affected put in

the drinking water twelve tablets to each pint of water, and give them no other water to drink during the treatment. This will cure the most obstinate cough.

If you have your poultry confined in runs, plow up some of the ground, so that the fowls will have some fresh earth to scratch in. They enjoy it very much, and it gives them a chance to find worms and other things which are beneficial to them. Fowls having access to the fields will find plenty of freshly plowed soil, but it is better to supply it close at hand so that they will not wander all over the farm. The little chicks also like to scratch and dig into freshly turned soil, and should be given every opportunity to do so.

The marketing of eggs is a feature which needs more attention. Many do not properly sort their eggs. Each lot should be as uniform in size and color as possible, and the culls should be used for home consumption. Private consumers should be served with eggs put up in neat packages holding one or two dozen each. Have these boxes clean and properly labeled. A neat package is a good advertisement. Have the eggs clean. No one cares to receive filthy-looking eggs. These little details are very essential in marketing eggs, and should never be overlooked.

So many poultry raisers lose sight of the fact that oats is more reasonable in price than other grains, and at the same time one of the very best poultry foods. When buying oats, get the very best quality obtainable. It is a much better feed during hot weather than corn, being less heatening and containing less fattening matter. If oats are boiled, they will be more relished by the hens. One quart of oats will swell into two quarts when boiled. Steel-cut oats also makes an excellent feed for young chicks. Sprouted oats is extensively used as a winter green food, and produces good results amongst the laying hens.

Poultry raisers who can spare a little time should study up the art of caponizing. Capons demand a good price upon the market, and are always in good demand. The operation process is easily learned and is so profitable that it pays any poultryman to try his hand at it. The slips are not lost, and if you kill a few by practicing you can sell the carcass on the market or use it for home consumption. Of course it is necessary that you have proper tools to do this work, but these can be purchased at poultry supply stores anywhere. Capons sell best in February, but also sell well during other seasons of the year.

The best mixture for whitewash I know of is the one used by the United States government. Here

it is: Take a half bushel of unslacked lime, slack with boiling water, cover to keep in steam. Strain through a fine sieve or strainer, add a peck of salt, preferably dissolved beforehand; three pounds of ground rice boiled to a paste; stir in while hot half pound of Spanish whiting and one pound of glue, previously dissolved. Add about five gallons of hot water to the mixture, stir well, and let it stand for a few days. Apply hot. One pint covers one yard. Will withstand the weather and will not rub off.

Do not send out eggs for hatching which you would not set yourself. Remember you are getting a better price than you would be getting on the market, hence your customers are entitled to something more choice than the ordinary run of eating eggs. When making a sale, fill the order with the object in view of getting another order from the same customer. Send a man nice looking good eggs, and he will order again when in need of something in your line, but send him cull eggs, and you will be the loser. There is just as much in working up a trade in the poultry business as any other line, and just as much efforts should be put forward to please the customers.

People living on rented premises should purchase portable houses or build movable structures. A

good, cheap house may be constructed from two piano boxes at a cost of about $3. A simple way to make such a house is to remove the boards from the tall sides of the boxes, place them on two joists, open sides facing each other, and then spike them down securely. Use the boards removed to patch up the open gaps between the boxes, and then cover with some good roofing material. Put in the door and windows, place your nests and roosts, and you will then have a house to accommodate a dozen hens. A good idea is to raise this house a couple of feet from the ground, inclose the back and two ends with boards, leaving the front open, so that the hens can use this space for a scratching place in bad weather.

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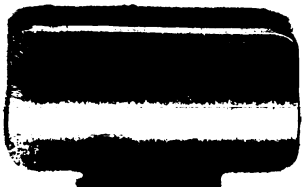
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